NEW WORLDS
SCIENCE FICTION

No. 47 2/-

DAN MORGAN

Commenting upon his story "Controlled Flight" in this issue, he says, "Before I started writing fiction I used to imagine that there were two possible methods by which good stories were turned out. (A) The story would, by some mystical process, germinate in the mind of the writer and burst into his consciousness fully grown. (B) That writing was just a sort of reverse and equally enjoyable process to reading and that the writer discovered the story in all its novelty whilst he was writing it. Now I'm only sure of one thing—it's not as easy as it looks and there are as many different methods as there are writers. I got the initial idea for my current story, believe it or not, from a paragraph in the *Manchester Guardian* reporting a dispute about parish boundaries in Lancashire !"

JOHN BRUNNER

"We have been coming slowly to realise that myths often grow out of no more than mild exaggeration of real events, and—more to the point—that word of mouth is something no natural catastrophe like fire or water can destroy, though people forget how to read their ancestors' writing. When we science fiction writers blithely set a story a thousand years in the future, we often forget that the characters are as far removed from us in Time as we are from King Alfred, and that probably the only thing the average man of the time would remember of things which to us are so important would be apocryphal and amusing stories like the burning of the cakes. In that sense, word of mouth among primitive peoples affords a better and more easily tapped source of information."

"Two By Two" grew out of the contemplation of one of the best-known of all legends.

NEW WORLDS SCIENCE FICTION

VOLUME 16

No. 47

MONTHLY

MAY 1956

CONTENTS

Short Stories :		
CULTURE PATTERN	*by Francis G. Rayer*	4
TWO BY TWO	*by John Brunner*	23
CONTROLLED FLIGHT	*by Dan Morgan*	42
UNWELCOME STOWAWAY	*by P. Quinn*	57
SOLD	*by Richard Rowland*	68
Serial :		
WHO SPEAKS OF CONQUEST ? Part Two of Four Parts	*by Lan Wright*	79
Articles :		
LUNAR OBSERVATORY	*by Donald Malcolm*	36
VERTICAL APPROACH	*by Kenneth Johns*	64
Features :		
EDITORIAL	*by John Carnell*	2
THE LITERARY LINE-UP	....	56
BOOK REVIEWS	*by Leslie Flood*	126

Editor : JOHN CARNELL

Cover : QUINN Interiors : QUINN, LEWIS, HUNTER & HUTCHINGS

Cover painting from " Who Speaks Of Conquest ? "

TWO SHILLINGS

Subscription Rates

Great Britain and the Commonwealth, 12 issues 26/- post free

United States of America, 12 issues $4.00 post free

Published on the last Friday of each month by

NOVA PUBLICATIONS LTD., 2 Arundel Street, Strand, London W.C.2.

All characters in these stories are purely fictitious and any resemblance to living persons is entirely coincidental. No responsibility is accepted for material submitted for publication but every care will be taken to avoid loss or damage. Return postage must be included with all MSS.

Printed in England by The Rugby Advertiser, Albert Street, Rugby.

Convention Time Again

The recent Easter vacation again brought Britain's annual science fiction Convention, held once again at the George Hotel, Kettering, in Northamptonshire, but this year it was a three-day meeting with a difference. The delegates from all over the country had met expressly to plan for the big London Convention to be held in 1957—either the official 15th World Science Fiction Convention, or failing a successful bid in New York this year when next year's site will be chosen, an International Convention to embrace the European Continent.

More than 100 delegates were in attendance to discuss next year's proposals. Foremost among these was David A. Kyle from New York City and Chairman of the Committee organising this year's 14th World Science Fiction Convention which will be held in the Biltmore Hotel, New York, in September. With him was American author Richard Wilson on a business trip, and they had the pleasure of renewing acquaintances with two further celebrities from their own country—Larry Shaw, editor of America's newest magazine, *Infinity Science Fiction*, on honeymoon with his wife Lee Hoffman, one of the most popular feminine fans in USA, who had been voted America's official TAFF representative to visit Britain this year but who had declined the offer in favour of making the trip as a private citizen.

International fandom was further supported by another American, Ellis Mills from Ohio, who had arrived from Germany where he is stationed with the US Air Force; Miss Anne Steul, one of Germany's leading *literateurs* in that country's fast-growing circle of fantasy enthusiasts, and who was largely responsible for the recent small but successful Convention at Wetzlar; while from Antwerp, Belgium, came Jan Jansen, leader of fandom in the Low Countries.

Emerging from the mass of discussion and suggestion put before the delegates, the following resolutions were adopted: (1) That Britain will officially bid for the site of the 1957 World Convention. (2) That, if successful, a large hotel in the centre of London will be booked with suitable accommodation for both business and social activities. (3) That, failing obtaining the World Convention site, an International Convention will be held instead. (4) The time, probably late September. This primarily to miss the congestion of the summer holiday period and also to allow Americans a full year between International Conventions. (5) The formation of a Central London Committee under the Chairmanship of myself, with representatives from all provincial areas joining the London Committee in a joint National Committee.

At the conclusion of the main business session David Kyle gave details of the plans for this year's four-day New York Convention and an outline of the difficulties his own committee had had to surmount, all of which was useful information for the newly-formed British committee then sitting in the hall.

Not all the programme at Kettering was formal—the opening session was an outstanding exhibition of hypnotism by W. H. Powers, who had eight or more volunteers on the stage completely under his control for nearly an hour. This is perhaps the most unique method of ensuring that a Convention commences on time and that the audience are completely held ! Another fascinating and satirical session was the 50-minute tape-recorded play produced by the Liverpool Science Fiction Society, some of whose members had been on a commercial TV programme with myself only two weeks previously defending science fiction from the enquiring reporters of the " Meet The Professor " programme.

Another social high-light of most major Conventions is the Fancy Dress Parade and this year at Kettering many outstanding futuristic costumes were in evidence at the evening session on the Saturday—the two most outstanding being a slug-like bug-eyed monster completely enveloping Eric Jones of Cheltenham who was responsible for the ' creature's ' mobility, and Ina Shorrocks of Liverpool as a green girl from Venus—the make-up for this was so eye-searing that many local inhabitants must have signed the Pledge when contestants were having their photographs taken outside the hotel.

Socially, this year's Convention reached a new high level of conviviality and one that completely surprised the visiting Americans who apparently had not expected anything quite like any of their regional or national Conventions.

Meanwhile, " down under " in Melbourne, Australians are preparing for their biggest national Convention to date, which will be held in December in conjunction with the Olympic Games. Full details concerning this major Australian project will be given in a forthcoming issue of *New Worlds*. And for the Spring of 1958, Jan Jansen of Belgium has proposed to organise a European Convention to be held in Antwerp in conjunction with the Belgium Trade Fair—such a Convention would give many British fans an opportunity of visiting neighbouring territory for both business and pleasure and the Belgium Convention is likely to be well supported.

Conventions seem to be rapidly becoming *the* thing and are certainly the finest way of bridging the barrier between professional and amateur and reader. Personally, I cannot think of any other form of literature which has such close support of its readership—it really is something unique, like science fiction itself.

John Carnell

CULTURE PATTERN

Readers will remember the scientific premise Mr. Rayer made in his excellent story "Stormhead" published in No. 40 last year. This month he produces another such outstanding idea dealing with a planet having a totally alien environment by Earth standards—and no known means of communication between the inhabitants and the visiting humans.

By Francis G. Rayer

Illustrated by QUINN

A dry wind murmured round the two vertical hulls of the ships, carrying tiny sand trails off across the desert. Ian mopped his brow, wishing the sun were low, instead of still rising slowly to its zenith. The fifty hour day of Pleione could seem infinitely long to a species accustomed to a planetary rotation of only twenty-four hours. With twenty hours since dawn, the sun was not yet at its noon, and thirty hours would pass before its slow setting beyond the hills westward. Added was the discomfort of the simoon that blew ceaselessly over the sandstone desert, crisping a man's skin and making his eyes prickle.

His boots sank in the dust as he plodded on to the shade of the camp, slightly bowed so that he looked less than his full six feet, blue overall collar up, and sunhat jammed low on his brown unruly hair to shade his neck.

A man had his head under the bonnet of a half-track lorry. He emerged, perspiring, and slapped dust from his brown overall.

"Distributor head gone, Captain," he stated.

Ian halted in the shade of the fringe of low bushes. "Suspect the natives again?"

Martin Withers wiped his face. Ten years Ian's senior, he looked young for thirty-five. " Who else ?" he growled.

Ian supposed he was right. No one in the camp would remove a vital part from the vehicle. The two ships had brought no trouble-makers. There was nothing on Pleione, or anywhere in the whole Pleiades group, to attract that type.

" I'll see if I can get something done about it," he promised.

" Be glad if you would, Captain."

The light sandy head disappeared again, and Ian went on among the huts of the earthmen's camp. Mentally he cursed natives who made off with vital parts certainly useless to them. His back prickled with heat under his captain's blue. He momentarily abominated even

the scientific investigation which had spotted a planet amid the two thousand scattered stars of the group, and landed two ships of sweating men upon her unspeakably arid surface.

A girl came from one of the smallest huts. She looked prettier than anyone had a right to, on Pleione, Ian thought. Joan Carrie, plain by name but not by nature, and technically co-ordination officer. So far there had been no co-ordination between Men and Pleionians, and he had to be disapproving. That was hard, with a girl of scarcely twenty-four, dark haired, grey-eyed, and now with a brilliantly white silk scarf vivid against the green of her overall. Blue for a captain, green for a civvie, he thought. But it was the only green thing he had seen in three weeks on the planet.

"More pilfering," he said succinctly.

Joan Carrie looked downcast. "Why do they do it?"

"That's what you're supposed to tell us."

Faint pink suffused her cheeks. "I haven't had time to establish communication with the natives—"

"I thought two to three weeks was the text-book interval for basics."

Her eyes flashed. "Likely enough—with a vocal species! The Pleionians are not vocal. They use no kind of audible vibration whatever, nor any other sound, so far as we can discover."

Ian felt contrite. Joan Carrie was qualified, he reminded himself. Nothing in the world other than ability would have got her a place on the *Wildshine*.

"Sorry, the damn heat." He let it sound an apology. "We're making a trip north as soon as Withers has got the half-track fixed. You'll wish to come?"

"Of course."

He left her. It was too easy to snap. Pleione was dry as tinder, and made a man's temper brittle. From a mile altitude the planet had looked promising, except for the dearth of visible surface water. Down, they had found her to be covered with low bushes and thin-leaved trees of slow growth and an indescribable dryness. Bushes and trees were brown, except for tiny shoots never visible at a distance. In three weeks he had found no lake, river or stream. Air and gravity resembled Earth. But there were no clouds to fend away the scorching heat of her giant sun. It never rained. No watercourses threaded the hills and investigation by autogyro revealed no vegetation of a nature suggesting damp soil. The whole planet was a tinder box.

The half-track was running evenly. As Withers cut the engine Ian wondered whether the theft of the distributor-head was chance. A child might remove it in ignorance, because it was detachable—or a higher intelligence might decide it was essential to the vehicle . . .

Two men in a second half-track had gone south, and Ian guessed they would only substantiate earlier exploration. The sandy plain ran south for many miles, bordering a forest a full hundred and fifty miles in extent. West, the forest was flanked by mountain ridges that trailed away into hills to the south. There, vast arid dunes ran across to the sandstone desert, enclosing a peninsula of woodland. Only one small Pleionian village had been located that way. As he mounted the lorry-step Ian wondered if the flat appendages of the Pleionians were handy at loosening distributor clips.

"With luck we'll be back before Penny and Sims," he said.

He hoped the northward exploration would be more promising than the earlier trip south. The autogyro showed much—but not villages hidden under the enormous, thin-leaved trees. Establishing real contact with the natives was now of major priority.

As he waited by the truck for the others Ian wondered if the expedition to Pleione would be wasted. The *Wildshine* and *Moorstone* had before now touched down on planets of a wondrous strangeness, leaving mankind with the narrow alternatives of clearing out again or committing slow suicide by remaining. Pleione did not appear that bad—yet. Main difficulties were the extreme dryness and lack of effective contact with the spined natives, who had observed man's coming without visible surprise.

Martin swung up into the truck and drank from a bottle of squash under his seat. "Driest place in the cosmos," he stated, grimacing. "Miracle there's so much vegetation."

"It's adapted to conditions." Ian got up. "Leaves are tiny. The trees are slow-growing, and judging from what we saw, have very extensive roots."

They had dug by the edge of the forest, seeking indications of subsurface moisture. There was none, but a mass of roots and fibres close as a woven blanket.

Martin lit half a cigarette, exhaled smoke a few times, and snuffed it out. His small ration never lasted.

"Think Miss Carrie will ever talk with them?" he asked.

"The natives? Should do—it's her job." And one she had shown ability at previously, Ian reflected.

"Perhaps they don't talk."

"All civilised species communicate somehow, it's the first requirement for progress."

Joan came from behind the tin huts. She paused, looking south. "Think we should wait for Sims and Penny?"

Ian shook his head. "No need for that." The truck the pair had taken was one with no radio.

They began following the edge of the sandstone desert, avoiding the occasional clumps of bushes that crept out from the forest. Dry wind sent thin sheets of dust speeding across their path and they drew on goggles.

"Ever thought what would happen if a forest fire started?" Joan asked once.

Ian eyed the dry woodland. Tall, resinous trees grew fifty- and eighty-feet tall from the blanket of brush high as a man, through which narrow trails wound.

"Probably be pretty bad," he admitted.

Joan stood up in the truck, the dusty wind stirring her dark hair. "Makes anything I've ever seen look like a kids' bonfire."

A mile from the ship site the woodland began to curve away slowly to the east, visible as a long, brown line ahead. They surmounted a slow rise, and Martin slowed the half-track abruptly.

"Some of our new friends," he said.

Three natives stood at the edge of the forest twenty yards away. Upright, they were a full six feet, Ian judged, and their fronts were of thick, wrinkled skin like the underside of a tortoise. Nearby were half a dozen thick pancakes, as he silently designated them, perhaps five feet in diameter, eighteen inches thick, and covered with spines. They rose as the truck stopped, displaying hairless undersides, and joined their companions, moving quickly on rudimentary feet. Nine pairs of dark eyes moved in unison, watching him as he descended. Each appeared ready to flop back on its belly, spines raised.

Ian halted and waved, smiling. Speech was useless and he had never heard an audible sound pass between the Pleionians. Some of them carried thongs hanging from one upper limb. Ian wondered whether chance or reason had prompted the theft of the distributor head.

Joan removed her goggles, revealing circles of clear skin. "I'll try them again," she suggested.

Ian returned to the truck. The nine flat faces directed themselves upon the girl, and he watched as she made symbolic movements with both hands. He could not pretend to follow her methods, but knew they were sound.

"Suppose they'll talk one day," Martin said, and reached for the last stub of his week's ration.

"Miss Carrie will find how, given time—"

A sizzling thud, and howl halted Ian's words. Martin fell back over his seat, cigarette flying, a hand clasped to his temple. He struggled up.

" What the devil !"

Blood was flowing from under his palm. Ian's gaze swept over him and back to the group fifteen yards distant. From the end of one stumpy forearm a loose thong still swayed. Martin's hand came on his shoulder.

" This hit me !"

His gauntlet opened to disclose a ball scarcely a thumb's width in diameter. Ian took it. Quite light, it was wood, carved to perfect shape, and undoubtedly thrown with astonishing speed and power.

" Wood !" Martin growled. " Why the devil *wood* !" His gesture took in the sandstone desert, where in moments a man might gather more pebbles than he could carry. He looked at the blood on his fingers, swore, and jumped from the truck. " Time *I* tried a little communication !"

The Pleionians watched him take five paces, then flopped upon the reddish dust. Nine thick, spined pancakes confronted Martin. He shoved the edge of one with his boot, and grunted in pain.

" They're not getting away with it like that !"

He fetched a crowbar from the truck and levered the Pleionian up and over. Its bare surface was momentarily visible, then hidden again as it folded itself head to toe. Martin poked it with the bar.

" Damn thing !"

" Better leave it," Ian suggested. He put the wooden missile in a pocket. " We'll go on north. From what I've seen of others these won't open up for an hour or more."

He looked back several times as they rode. The Pleionians were motionless, one rolled, the others flat heaps of steely spines.

" I believe they converse by wrinkling their thorax skin," Joan said as they dwindled from sight.

Ian looked at her quickly. " Going to be difficult to learn ?"

" Probably."

He saw she would not commit herself. " What do you think of this ?" He put the wooden ball in her hand.

She examined it, face pensive. " Looks as if it's been used before, and retrieved." She indicated abrasions on the hard wood.

Martin scowled in the driving seat. " Why attack me ?"

Joan Carrie shrugged. " Attack ? Perhaps it was—defence."

Martin grunted disbelief. " I hadn't threatened them !"

Nearly three miles from camp, a broad clearing ran into the woodland and hut roofs were just visible amid the trees. They turned in, the truck engine echoing from the high trunks. Pleionians appeared at the hut doors, paused, then melted with quick steps into the forest. The vehicle halted among deserted buildings made of sticks and mud.

Ian descended, disappointed, though it was the biggest village yet found.

"Let's investigate," he said.

After an hour his disappointment had changed to astonishment and admiration. The huts were beautifully made, never crude, and internally showed a high standard of culture.

"They never cook," Joan observed.

Ian looked round the hut they had entered, with its coloured woven bed, carved ornaments, and smooth plank floor. "Vegetarians, I suppose."

Nowhere had he seen any fire or cooking arrangements. It was, he supposed, never cold.

"Writing," Martin put in.

He held up a book of bound sheets, each covered with strange characters. Ian wondered if Joan could make anything of them—probably, given time.

The air in the hut was oppressive with heat, and he went out. It might be unwise to leave the truck unguarded. The thought had scarcely come when he realised the vehicle was gone. Or was he mistaken, amid the orderly huts? A quick search showed he was not and he summoned the others. The marks where it had rested were clear, as were the incoming tracks, and a second series apparently leading back to the desert.

"I'll swear the engine didn't start!" Martin said.

They ran back along the cleft amid the trees and emerged upon the sandy plain. The half-track truck stood two hundred yards out in the desert. Far away to the left a score of forms were slipping into the trees and Ian had a glimpse of long ropes they carried.

"Damned funny reception!" he growled.

The vehicle was unharmed and started at once. Martin pushed up his goggles and wiped sweat from his eyes, leaving a dusty smear. Ian saw unease in his glance. A stillness had settled over the desert, but he knew it would not last for long. The wind always blew a little; sometimes it blew strongly, whipping dust across the dunes.

"We'll go back to camp and see if Sims and Penny have found anything," he suggested.

He hoped Joan might make something of the book, and that it could help. The Pleionians were civilised—and civilised races had customs and rules of conduct. It was increasingly clear that in some way those rules were being broken by the men from the two ships, and that could be dangerous. A man might break a taboo without knowing, and therein lay their danger.

They drove into the face of a mounting wind that carried dust even more thickly. Never had he experienced so dry an atmosphere, Ian thought, as he sweated on the bumpy seat. He looked for even a tiny cloud, and found none. The sun was past its zenith, hot and unblinking, glaring on the flanking rim of trees so that they shone like painted scenery under arc-lamps.

" Hell, but it's *hot*," Martin grunted once.

Dust sped back in a long trail from their tracks, and the silvery lances of the two ships dawned out of the haze ahead. Ian opened his mouth to speak, and closed it with a snap. The others could see for themselves—and words had flown : the tin huts and all their equipment stood a good two hundred yards out in the desert, apparently transported wholesale.

" And what d'you make of that ?" Martin demanded for the fifth time, his sandy hair tumbled and his light blue eyes screwed up in disgust. " Everything's exactly as we left it—"

" You *wanted* to find something damaged ?" Ian asked, irritated.

" Not exactly—but it would help explain."

Ian left him. The sun, now low, struck the huts fully, and the temperature was unendurable. He planned to sleep amid the trees and felt he needed it, after a mere two hours' cat-nap that mid-afternoon. Fifty hours of daylight were a nuisance, difficult to adapt to, as were the fifty hours of gloom reduced only by Pleione's single, small moon.

Most of the scientific data had already been stored : air content, gravity, and innumerable samples of insect, plant and mineral. The lack of surface water was awkward, but not final, he thought. The natives drank from deep wells that dotted even areas where no village stood. Some nights there was a fine, immeasurably gentle precipitation of dew, just detectable by instruments, and enough to maintain the dry, brittle vegetation. Not from natural forces did any threat come, but from the natives. Taboos too often broken could arouse an anger which would sweep the Earthmen away.

He found Joan. " First we've got to get an idea of what we're doing wrong," he pointed out.

She looked tired. " You feel we're getting on the wrong side of the natives ?"

" Almost certainly. That's why I won't have the huts moved back into the shade. Judging from the local population level, there may be a hundred million natives on this planet. We cannot colonise if they oppose. No one back home approves of force, even if we could maintain ourselves against attack, which is doubtful."

He went to sleep wondering why Sims and Penny were overdue, and wishing they had radio, to contact the hut station, autogyro, or half-track truck. Both had been confident of early return, and were experienced men. Thus could an unimportant oversight assume serious proportions, he thought.

He awoke with Pleione's small moon glowing weakly behind the tall trees, and saw he had slept over six hours. The air was less hot, but very dry, absorbing moisture so that his lips cracked as he yawned. He rose, slapping his clothing, and dust drifted like mist, subsiding among the trees.

"You trust them more than I do, sleeping here alone," a voice said.

Martin came from the shadows. Ian folded the blankets upon which he had lain.

"They haven't shown general hostility yet."

"Then let's hope they don't!" The other felt the lump on his brow. "Sims and Penny aren't back."

Ian knew that fact had been nagging at his own mind. Not for another thirty hours would the sky begin to lighten in the east, with infinite slowness as the sun dragged reluctantly up. The night was silent. South lay a hundred and fifty square miles of the central forests, the sand gully, and then nearly fifty square miles of the south forest. If mischance had arisen, the missing pair could be anywhere in that area.

"I'd like to take the autogyro," Martin said.

Ian frowned. "Risky, at night."

"Not if I keep along the edge of the desert. I could land there in moonlight."

A good plan, Ian thought. The little autogyro was extremely safe, and economical enough to stay aloft until dawn, if necessary.

"Keep in contact with us at the camp," he suggested.

"I will."

Martin vanished amid the tall, slender trunks. Time to go back to camp himself, Ian decided. Only an occasional rustle, very faint, told that living things other than he was in the forest. Minor creatures were few, though large-eyed, squirrel-like rodents were sometimes glimpsed among the trees.

He went back to camp. Two crewmen quartered in the *Wildshine* had helped get the autogyro ready and echoes drifted far across the sandstone plain as it took off, skimming south. Joan had returned to sleeping in her ship, Ian noted, but Bill Miles, the tall radio engineer from the *Moorstone*, was in the hut that had served as radio shack.

" Beats me how all this stuff was moved without being got out of order, Captain," he said.

Ian studied the radio gear, several separate, interconnected units. " None of you in the ships saw anything ?"

" No, sir." Miles turned power switches and waited for the transmitter to heat. " Our sleep period. You said watch need not be kept."

" True enough." The men had wanted rest. " Any opinion how everything was moved ?"

" Mostly by hand, I'd say—if hands are what they have. It's mostly sandstone, here, but there were some tracks. Also a few indications that they used a wheeled vehicle for the heavier stuff." He indicated the set. " This was disconnected, carried in separate units, and re-connected correctly. There was no other way."

A carrier came on the speaker, and Ian was silent. The Pleionians were not ignorant savages—that was growing increasingly clear. They had brains, civilisation. Also definite ideas about the proper place for things like tin huts and half-track trucks !

" Withers here," the speaker said.

" You are strong and clear."

Miles looked at Ian questioningly, and Ian took the hand mike. " Martin."

" Yes, Captain."

" Keep talking to us if you see anything of note."

" I will."

Ian left Miles standing by and went out. Martin's trip would not take long, but searching systematically over the miles of woodland might be a very different matter.

A Pleionian was coming from the forest, walking with a waddling motion. It halted two paces away, tall as Ian, its round eyes fixed on him. In the moonlight he saw that the skin of its thorax was wriggling irregularly.

" So that *is* the way you talk !" he said.

The wriggling stopped, then began more rapidly. The Pleionian extended one flipper, rather like that of a walrus, but with opposing digits. Between them was a cylinder of wood several inches long and round as a closed fist.

Ian took it automatically. The thick folds of skin wobbled, then were still, as if the creature knew it was not understood. It turned and went back quickly into the forest, spines glinting in ridges as it moved.

Ian looked at the cylinder, and his brows rose. The whole surface was covered with carvings of wonderful delicacy. Undoubtedly a job for Joan !

At the ship he talked with her for half an hour, and found she had got no nearer an understanding of the natives' language. A spark came in her grey eyes as she studied the cylinder.

"Possibly they have no hearing," she said. "Similarly, skin-wrinkling is out, for us. With no common basis, there can be no communication. But a *written* language may be a very different thing!"

"Work on it all you can."

He left her. Back in the hut Martin was talking on the radio. "No sight of the truck yet. The sand gully is away to my right. Beyond is the south forests. As they were Sim's main interest I'm beginning from there."

The murmur of the craft's motor drifted from the speaker. Ian went outside, standing in the long parallelogram of light thrown through the open door, and listened. Wind whispered past now, more brisk, hot and dry as a midsummer noon. Ports of both ships stood open, circles of reflected light.

Miles went off duty and Ian sat on a case of equipment, waiting a replacement radio-watch. Two hours had passed since Martin had left, and the speaker awoke again.

"Withers to camp."

Ian started at the voice and its undertone of excitement. "Captain here."

"I've seen the truck. It's out from the trees near the end of the sand gully towards its south end."

"Sims and Penny?"

"No sign of them yet." The background drone changed, showing Martin was banking down. "Too distant to see properly. There's nothing moving." The engine murmur faded again. "I'm dropping low. If they've heard me they haven't signalled."

Silence came, then a grunt. Something in it made Ian grasp the microphone fiercely. "Martin!"

"Sorry." The word was clipped, urgent. "Yes, they're there—dead or unconscious. By the truck."

"Land and investigate!" Ian snapped. "Don't get out unless it's safe!"

"The truck is two hundred yards from the forest." Wind swished audibly through the rotor blades, followed by bursts from the motor. "I'm fifteen yards from the truck." The voice was clipped, precise, resonant with the efficiency that had gained its owner his place on the *Wildshine*. "No movement. No natives. I'm getting out to fetch Sims and Penny."

The silence grew, broken only by the occasional swish of sand grains upon the tin hut. A strange bumping came over the radio link, then Martin's voice.

"Sims is dead—killed. Penny is unconscious. They've been attacked."

"Bring them back," Ian snapped.

"Will do."

Outside, Ian wondered what disaster had arisen fifteen miles south across the wooded plain. *Attacked*, Martin had said. He would not make a mistake over that.

A murmur grew, and the autogyro slanted down out of the southern sky. It turned to taxi near, and the headlights went out. The relief radioman was coming from the ships and Ian called him.

Sims was beaten to death. Penny was unconscious still, head bruised. Probably he would live.

Martin stood in the radio shack with a hard expression on his face. "So they're not so harmless," he growled.

Ian felt it did not fit, yet. The brutal attack upon the two men was not such as he would have expected from the Pleionians, placid race hitherto wholly unwarlike.

"Any indication of the reason?" he asked.

Martin shook his head, loose throat-strap swinging. "None. Looked to me as if they'd been attacked from behind while eating."

"No injured natives, or signs of a fight?"

"Not that I could see."

Ian watched the second stretcher go from view. "I don't believe this planet's species would murder without cause. I'd like you to take me out."

Martin shrugged. "Nothing easier, Captain."

Ships and sand silvery with moonlight drifted behind. The great central forest sped past. flanked far to the west by hills that joined the sand dunes edging the south forest. The long sand gully, half a mile and more wide, slid by, and Ian picked out the truck. Martin put the autogyro down near it.

"Wait here and keep your eyes open," Ian ordered.

"Will do, Captain."

He searched round the truck, examining the sand. There had been no fight. But tracks led from the forest, and he followed them, a possibility dawning.

The truck had been pushed out from the edge of the forest. Sims and Penny had camped there, a stone's throw from its rim, and a dead, flattened camp-fire, and opened tin of beans, showed Martin's guess

had been in part correct. The beans were cold, as were the cinders. The fire could not have been more thoroughly extinguished if a score of elephants had tramped it into the dust. Yet Ian knew no such creatures had been there—only Pleionians.

Martin was standing by the autogyro. He dangled a plastic casing with nine leads in one hand. " I'd like to drive the truck back. You could take the plane. I glanced at the truck's engine when I fetched Sims—the distributor-head was gone, that's all."

" Again ?" Therefore reason, not chance, Ian thought.

" I also had a crewman dump a pack transmitter in the plane," Martin stated.

" Good." Ian saw his last objection was gone.

" With luck, I can make it back in an hour."

Martin went to the truck. Ian watched him a moment, then returned to the autogyro. He noted that Martin had already removed the pack transmitter, good for twenty miles range at a pinch, and had put it by the driver's seat. Within ten minutes the truck's engine started. Martin waved, and Ian took the autogyro up, and turned it for camp. Memory of the flattened fire lingered. He scowled and nibbled his lower lip as the dark brown woodlands slid below his stumpy wings. Theft of the first distributor-head was not chance, but logic, showing intelligence. Similarly, then, could he assume the attack on Sims and Penny was logic ? If so, what was its basis, grave enough to prompt murder ?

The craft swished down to the silver sand, bumped lightly, and halted, rotor drifting into motionlessness. Miles came from the radio hut, half running.

" There's a fight started in the trees, Captain !"

" A fight ?" Ian descended, astonished.

" Between some of the natives ! Listen."

Thumping, punctuated by sounds of rapid movement, came from the forest. Ian peeled off his helmet.

" How long has this been going on ?"

" Only a few minutes—began just as you were preparing to land."

" We'd better look. None of the men are there ?"

" No, sir. They prefer the ships."

Reasonable—and safer, Ian thought. But understanding of a planet's predominate species was not achieved by sitting safe in impregnable ships while indigenous beings lived and died unobserved outside.

" Better be careful," the radio engineer warned as they moved in among the trees.

The matted carpet of root tendrils was soft under Ian's feet, the Pleionians too occupied to hear or heed his approach. A group

swayed and bobbed amid the trunks, concealing something in their midst. He moved closer, nerves taut, and flashed his electric torch upon the heaving mass. Round, dark eyes turned on him, then were gone. The group melted, was lost amid the trees, and he found his beam directed upon three crumpled forms — Pleionians, and dead. The sheer fury of the overwhelming attack had almost flattened them into the resilient earth.

Repulsed, he walked round the motionless shapes. Two were of usual size; one was much smaller. He wondered if the three had been a family, parents and child, all slain.

" The whole lot are nuts—killers !" Miles declared from the shadows. " Sims and Penny, then this. We'll be next !"

The three had fought back. The adults still grasped finely-smoothed staffs; the half-grown offspring clutched a stick to which was fastened a pointed flint. But the attack had been too violent and sure.

" Let's get back to the ships," Miles urged uneasily.

Might be as well, Ian admitted. " Check that Withers is all right."

" Yes, sir."

Ian returned to the twin vessels slowly, unable to understand what he had seen. Everything had suggested the Pleionians were sane, kindly, peaceful . . . until Sims had died. Now three fellows had perished, killed by their own kind.

Miles reported Martin Withers was making progress, but might camp at the end of the gully to wait dawn, as finding a way between the trees was difficult. Ian ascended into his ship, and found Joan pouring over the wooden cylinder, scores of sketches at her side. He watched her.

" Make anything of it ?"

Her head shook, not rising. " I can, given time. It's easier than the symbols in the north village sample. It's no Rosetta stone, but logically arranged. I've got a dozen characters or more, and others are coming."

He felt interest. " Understand anything from it ?"

Her grey eyes flickered momentarily upon him. " A man who knows a dozen English words can't read English."

" Sorry." He realised that circumstances were putting an edge to his voice and impatience. " You'll let me know when you get anything definite."

" Of course."

He left her and descended to the sandstone plain. Half the fifty-hour night was gone but the air was still hot and dry. He contacted Martin from the hut, learned the truck was definitely risky to drive until dawn, and agreed Martin should camp. Outside, the wind had

brisked a trifle, coming more from the south. It carried the woody smell of two hundred square miles of forest. Away beyond the north village were literally hundreds of thousands of square miles of exactly similar forest, Ian thought. Pleione was wooded everywhere except on very high ground, and where sandstone lay exposed. Never was there a planet so dry, so wooded, so baked by uninterrupted mid-day sun . . .

He frowned, walking amid the huts. The whole planet's surface was a tinder-box . . . no water, no rain, long, dry days. And the trees, slow-growing, resinous . . .

An undefinable unease drew at his nerves. The smell of the vast forests was like tar in his nostrils. Miles away, Sims had been killed cooking beans. *Cooking beans* ! Ian thought. A shock ran through him. He was momentarily stunned, then his feet were flying back to the radio hut.

Martin was a long time answering. He sounded bored. " Withers here—"

" *For mercy's sake don't have a camp fire* !" Ian's fingers were steel around the microphone.

" A camp fire— ?"

" That's what I said !"

" But cold beans are muck."

" Then you've got a fire ?" Ian rapped.

" Of course." Martin sounded hurt.

Ian groaned aloud. This, on a planet where the whole native culture was directed towards one end, if he guessed correctly. His teeth snapped.

" *Go put it out* !"

" I don't see—"

" *Put it out* !" Ian's roar shook the tin walls.

There was a pause, then : " Very well, will do."

Ian put down the mike, wondering if Martin thought him mad—if, perhaps, he was mad. How could a creature of green, wet, steamy Earth understand the minds of beings born on a world sun-baked and arid as Pleione, or comprehend what basis for survival might have arisen ?

He was only at the hut door when the radio bleeted furiously. Martin's voice was echoing from the speaker before Ian could gain the equipment.

" Captain here !"

" Wind blew the sparks across and the forest's started burning !"

Ian felt shaken. *Too late*, he thought. " Put it out if you can ! We're on our way."

"A strip twenty yards long is on fire—"

"Don't talk, Do what you can!"

"Yes, Captain."

The speaker fell silent. Twenty yards, Ian thought as he ran from the shack. Two hundred square miles—the whole of Pleione's wooded surface?

A general alert brought every man in the two ships awake and out. Four trucks in all were available, two very powerful, with bulldozer scoops at present not even unloaded. If the worst happened, they could perhaps confine the blaze to the south forest. Ian decided as he waited impatiently for the autogyro to be re-fuelled. West, the sand gully ended in sandhills. South was desert, linking up with the sandstone plain east.

He should have realised before, he thought as he gave final orders and took the tiny craft up. The high temperature and low humidity, parching up the universal woodland, made even a cigarette end vitally dangerous.

Red tinted the southern sky and the smell as of a pitch furnace in blast came on the wind. At two miles distance Ian could see the black smoke pouring up into the moonlit sky. He jerked the helmet mike round to his lips.

"Captain Summers here."

"Listening, sir." An edge was to the radioman's voice.

"Get all the trucks and men down to make a fire break from the gully to keep this lot from spreading!"

"They're on their way, sir!"

Smoke came from the south on the dry wind, bringing a momentary blast of hot air. Ian circled up and north again, until he spotted the headlamps of the trucks bouncing along the edge of the desert. In the trucks jogged fire-fighting equipment from the ships, efficient but never intended for a purpose such as this.

"Withers through from truck," the radio said. "He reports the fire is absolutely out of his control."

"Order him to leave and join the others!"

Seen from altitude, the fire was a blazing patch perhaps fifty acres in extent, red tongues reaching up amid the tall trees. Time yet to confine it, Ian thought.

Within an hour his opinion had changed. The trucks swept in, bulldozers scraping lanes through the bush. Men worked with axes, sweating, illuminated redly and drawing back as flames crept up. Then the wind brisked. A shower of sparks and leaping fire raced along the ground and through the treetops, white and sparkling like a living

thing. The fire was half a mile long and a mile wide and Ian saw it had won.

" Order the men right back to make a break from desert to gully !" Better abandon the whole fifty square miles of the south forest than lose the fire altogether, he thought.

" Yes, sir !"

The man's voice was scared, and Ian guessed he could see the glow and smell the fury that was spreading like a great red weal. As the trucks withdrew, long streamers of flame leapt onwards. Behind them the heart of the fire blazed red and white, sparks rising as great trunks fell.

Ian banked across over the gully where Sims had died. Two miles wide at its southern end, it stretched north-east for several miles, petering away into the forest. Between its point and the desert the neck of woodland offered a line of defence.

The trucks began to lurch up and down, headlights blazing, shovelling away brush and saplings. The fire had quite two miles to come, Ian judged. The time that permitted depended on the wind.

He repeatedly criss-crossed the area, watching the red fury to the south grow in size. Two hours passed, and a clear line, visible in the moonlight, began to appear across the neck of woodland. As the flames approached, the line grew broader, revealing heaving machines and sweating men. Martin had joined them, his truck hauling felled trees aside, and Ian's hopes rose.

Dawn was approaching when the fire reached the break, burning a trifle more slowly, but still pouring flame a hundred feet high. Occasionally long streamers reached ahead, sluicing through the bush like flaming liquid, adding everything it touched to the incandescence. The front of the fire grew straight, levelling with the fire-break. Then, slowly at first, red began to reach across.

Ian dragged off his goggles, wiped them, and took the autogyro higher. Half a dozen slow, red fires were inching across the line of cleared forest !

He took the craft down on the desert edge amid the trucks. Martin came running, yelling above the crackle and roar of flame.

" It's the roots, tendrils, compost—yards and yards thick of it !"

The ground itself was burning ! Aghast, Ian knew he should have anticipated it. The woodland grew on a strata of combustible material that had accumulated for millions of years.

A bulldozer nosed into the fury, and sank almost from sight amid glowing cinders. It backed, tracks throwing clouds of embers over driver and crew, and Ian knew they had failed.

This was the culture pattern of Pleione ! Make no fire. A creature who made fire risked the planet itself. Wooden missiles, because stones

could cause sparks. Kill a child if it makes a stone axe. Kill its parents if they try to protect it. Survival is a hard master, but one who must be obeyed. Kill a man if he smokes, if he uses a camp fire. Move his dangerous machines from the brittle, explosive forest. And Men had not understood, because to mankind the discovery of fire had been his first step upwards, not a catastrophe able to plunge the planet back into a dark age.

" Get into the trucks and back to camp !" Ian roared. " The woods narrow between the ships and west mountain ridge ! If we don't stop the fire there we'll die fighting it !"

The central forest would have to go, all hundred and fifty square miles of it. Only thus could they gain time. If the fire escaped, then the thousands of miles of tinder-dry woodland to the north would follow.

Ian was scarcely aware that dawn had come. Just north of the ship site the bulldozers swept aside brush and trees, and began working on the earth itself. But it was no earth, he thought as he swung an axe. It was a layer of roots and debris from above, varying in depth from a few feet to masses fifteen and twenty feet thick.

They had been working an hour when the trees of the central forest began to vibrate with a queer, whispering murmur of terror. Out from them swept hoards of the tiny squirrel creatures, tails streaming, eyes wide. They leapt from tree to truck, and truck to tree, bridging the gap, thousands upon thousands, and then all were suddenly gone. The whisper of terror subsided, moving on into the vast northern forests.

It was almost noon when the roar of the fire dawned into hearing. Many men had not slept or eaten in the twenty-four hours. Ian took up the autogyro, and was aghast at the holocaust of the central forest. The updraught of hot air made flight over the area impossible, but he circled north and saw that the fire had reached the sandhills and mountain ridge, there to halt reluctantly.

They began throwing explosives when the fire-front was five hundred yards from the gap, snuffing down the fury of the blaze and keeping the flames low. Gusts of blastingly hot air struck them, forcing them back, arms shielding sooty faces. The bulldozers lurched upon the very rim of advancing fire, throwing the brush back again and again, but always withdrawing. The wind freshened, blowing strongly from the south, then fell. The sun was halfway between zenith and setting when Ian knew they had won.

He left half the men patrolling the gap, watching for creeping tongues of flame. Others scoured the intact forest edge ceaselessly, fire-extinguishers ready to quell any spark carried on the rising air. Embers

still rose half a mile in the sky, falling through the twenty-thousand feet column of smoke that rose awesomely from the remains of the central forest.

The sun was very low when Ian became aware of a strange procession coming out of the north forests. Searchlights played on the gap, where men still watched. The autogyro was just descending from a survey of the untouched woodland, to assure that no fire had started there. But not to these things did the Pleionians give attention. Instead, Ian saw they were approaching him with a determination that spoke of prior agreement and plan.

Joan, plastered with soot from driving a truck, came up beside him.

" Another few weeks and I'll know their writing," she said.

He indicated the advancing line. " They won't wait that long."

He wondered if this was to be the end for men on Pleione. Men had committed the unforgivable, jeopardising the planet.

The leader halted, laying a moon-shaped disc of wood at Ian's feet. Joan's breath hissed in relief.

" Their symbol of peace and thanks—"

Ian relaxed. " Thanks ?"

" Presumably for halting the fire."

The others passed in single file, depositing gifts upon the token of peace. Odd creatures, Ian thought. The oddity had arisen from the pressure of circumstance. Without fire, mankind would never have survived as a naked, helpless being. Fire had been Man's great discovery, a shield protecting the beginnings of his civilisation. Denied that aid, the Pleionians had developed spines. Creatures who used fire would be about as welcome as madmen running amok with the power of universal destruction in their hands. The knowledge brought inspiration.

" We'll begin with lighters, cigarettes and matches !" he said. " Yes, even Martin's !"

Pockets were turned out and a tiny pile grew on the dust. When finished, Ian withdrew from it, gesturing. The Pleionian leader took up waterproof matches, opened them, and struck one deftly. A rustle passed among his fellows. He placed the match upon the sand, and extinguished it, scraped a hole, and pushed the earthmen's offerings into it. Ian watched the sand stamped flat.

" Good," he said. " They understand us now, and we them. The latter is important. While we're here we respect their culture pattern. Only madmen make fire. Fire is insanity, death. Never use it."

He looked at the thick, drifting smoke. Every planet imposed its own conditions for survival—adherence to those conditions was not fanciful generosity, but necessity.

Francis G. Rayer.

Stories concerning Man's first landing an the Moon are so commonplace that the theme seems almost played out—but not quite, as John Brunner proves below. The amazing coincidence, however, is that in February, several weeks after this story was accepted. the lorgest sunspot ever recorded appeored on the Sun disrupting radio and television communications round the world.

TWO BY TWO

By John Brunner

Illustrated by LEWIS

The circuit was fuzzy; there were all kinds of noises coming out of the speaker that should not have been there. Arkwright experienced a momentary surge of panic, and threw a quick glance over his shoulder at the viewport which happened to be turned towards the sun. There was a broad shallow bite out of the left-hand edge.

Then Costello's high, rather over-carefully accented tones sorted themselves out of the hubbub. " Hello, Moon One ! Arkwright, can you hear me ?"

Arkwright breathed a gusty sigh. " Yes, I can hear you—just !"

" What's the trouble ?" the reply came back; the time-lapse was almost at maximum now, for the ship was dropping towards the landing. " Would you check your transmitter ?"

" The fault's not in the equipment," said Arkwright sourly. "Have you taken a look at the sun lately ?"

" I can't say I have. In fact, I haven't left the block-house since you blasted off, I don't think." A spatter of interference muffled the last syllable, and Arkwright waited for it to die down before he went on.

"There's the biggest sunspot I've ever seen coming around the disc," he reported. "Can you check with the observatory—have them find out what's happened?"

"Of course. I don't see there's much we can do about it."

"They may be able to tell us how long this blasted interference is going to go on for."

"Possibly. Okay, I'll do that." Costello was silent for a moment, as if he had covered the mike to speak to someone else. "How far are you from the surface now?"

"About six hundred and twenty seconds," Arkwright answered, glancing at the chronometer. "Braking procedure should start at a hundred and fifty."

"Fine. You're on schedule." Even Costello's formal, clipped speech didn't hide the intense excitement he felt. "We'll be watching and listening. Good luck!"

"Thanks," said Arkwright, and pushed himself away from the handholds he had been gripping. The straps of the acceleration couch floated in mid-air; he caught the nearest and drew himself down on to the air-filled pad. Giving a final look around to make sure he hadn't carelessly overlooked anything floating which the deceleration would knock to the floor and break, he wrapped the straps around him and fastened the clips.

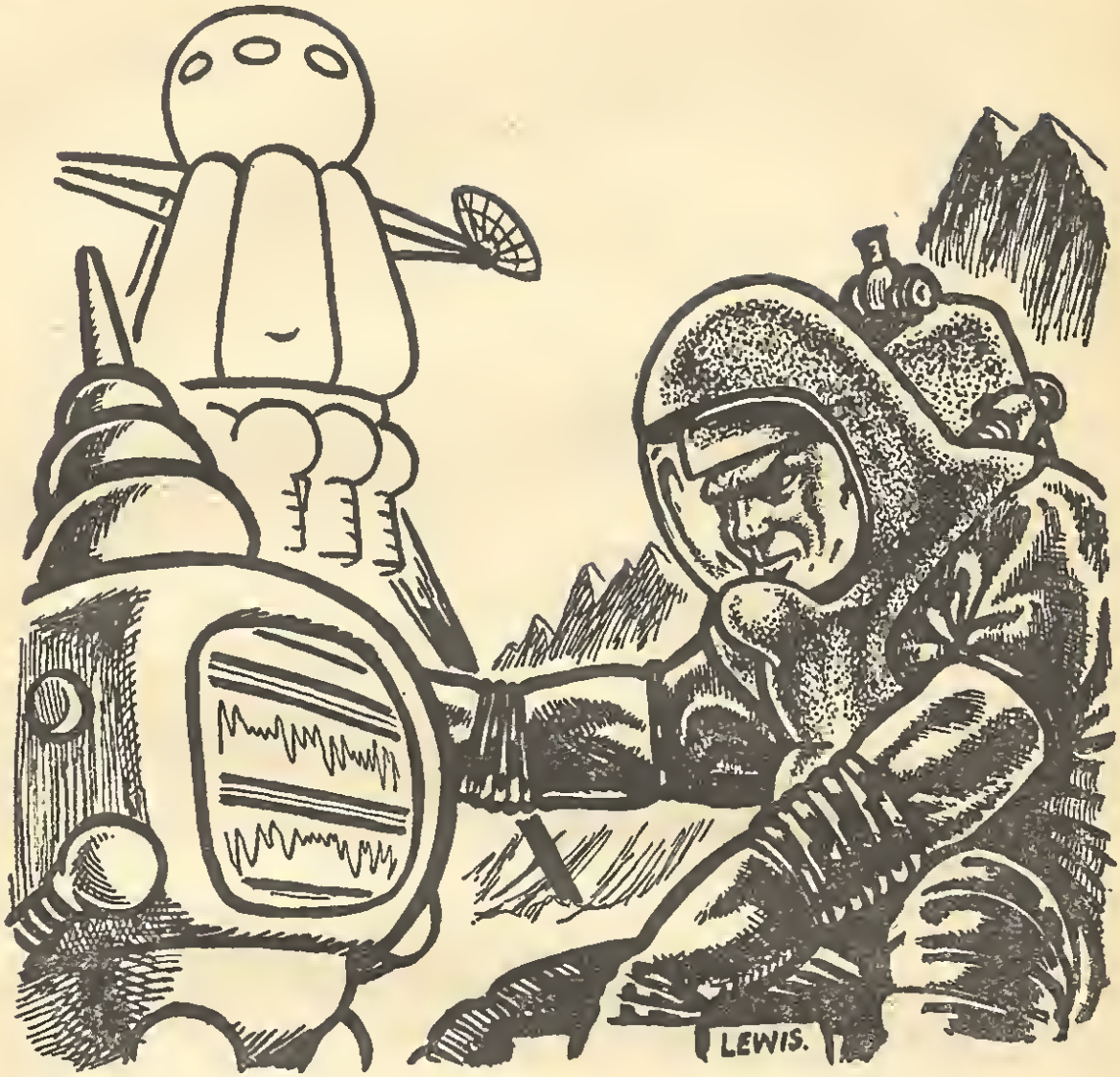
Well, for better or worse, this was it.

Behind him, in the heart of the atomic reactor, relays were answering the second-by-second click of the master chronometer; dampers were winding out on their screw rods, the radiation level was building up and dashing a deluge of gamma against the shielding separating the engine from the pilot compartment.

Precisely and exactly at the hundred and fifty second mark, the pumps leapt into life and thundered a cataract of propellant into the centre of the cylindrical 'firebox.' The temperature there approximated four thousand degrees centigrade.

At once the propellant, heated in a fraction of a second from the coldness of the ship's sunless side, expanded with explosive force, and a white-hot tongue of dissociated molecules sprang out towards the barren surface of the moon.

A slap of deceleration, like being brought up short on a breaking rope; Arkwright sank with a gusty sigh into the cushions. His eyes were fixed on the plumb-bob which indicated the ship's attitude as it poised perilously on its tenuous pillar of gas, his hands ready to slam home the emergency accelerator if by mischance the gyros precessed and the ship toppled.



The plumb-bob remained steady; yard by yard, and at last foot by foot, the ship settled to the smooth floor of the *Mare*; the main hydraulic landing leg found solidity; the weight of the ship compressed a telescopic section at the top of the leg and closed a relay; four other extensible legs shot out and found a purchase, and the engine's roar died away into a sigh and then into silence.

A man was on the moon.

Stiffly—after nearly four days without gravity at all, the lunar pull tried his muscles—Arkwright got up and walked uncertainly towards the viewport. The one he chose showed the stark black-and-whiteness of a ringwall, scattered mountains, hillocks and jagged rocks—and Earth, hanging like a blue-green fruit against the unbearable blackness of the sky.

"I made it!" he shouted across the cabin, as if the microphone were a human listener. "D'you hear me? *I made it*!"

A torrent of solar static laughed back at him from the speaker; when it cleared, Costello and many other people—it seemed that everyone on the project must be singing and shouting behind him in the blockhouse—were already calling their congratulations into the circuit.

"Are you ready for New York now?" cut in a strange voice. Arkwright blinked; he hadn't been warned about this.

"Yes, I think so," Costello answered, and another new voice—thick, plummy, with a strong accent—broke in.

"Mr. Arkwright, this is Secretary-General Siglund of the United Nations speaking. News of your attempt to reach the moon was released this afternoon, and in a special session convened to congratulate your government on its enterprise, it was agreed that I should ask you to claim the moon's surface as international territory."

Arkwright was surprised to find his hands shaking; he folded them together to still them. Siglund went on, "Your government's representative was kind enough to make the suggestion himself."

"This conversation is being recorded for world-wide broadcasting," Costello put in. "It will be the first official announcement of this policy."

And *that*, thought Arkwright, is one of the most sensible ideas they've yet come up with.

"You've been alone up there in outer space for—four days, isn't it?" Siglund continued. Have you anything to say—?"

"Yes, I have," said Arkwright, steadying his voice. "In making a formal claim for the moon on behalf of the United Nations, I'd like to say that—standing up here on the moon—the Earth looks awfully small. But it's awfully important, too. There won't be room on Earth for our quarrels and arguments when we make a habit of facing the enormous sizes and distances to be found in space.

"And in claiming the surface of the moon on behalf of the United Nations, I would like to add that I hope it will be realised soon by everybody that what I say is true."

"Thank you," said Siglund. His voice became almost wistful. "How does it feel to be the most famous man in the world, Mr. Arkwright?"

"Ask me when I get back," said Arkwright dryly. "I'm not over the shock of finding myself up here yet."

A burst of static interrupted him, and the speaker spat and crackled loudly. Glancing up towards the sun, he saw that the stain on its edge was visibly creeping across the disc. It was as sharp as if a transit were beginning—but he knew there were no transits due.

There were almost too many things to be done for him to think about his achievement during the first twenty-four hours of his stay. Donning his spacesuit, he went out—first to try the sensation of being able to jump six times as high as on Earth, then to attend to serious business. The greater part of his cargo consisted of scientific devices connected to a recorder and a telemetering unit; he had to set them up far enough away from the ship to be unharmed by the blast-off later.

He aligned their antennae towards Earth and set them working; Costello informed him that their signals were muddy, which was hardly surprising—his own voice could at times scarcely be made out through the intervening noise. With growing anxiety Arkwright looked towards the stained face of the sun.

"What's going on with old Sol?" he demanded.

"We don't know," confessed Costello. "Practically every observatory on Earth is trying to cope with thousands of visitors wanting to look at your ship—it's visible in a decent-sized instrument. I got on to Dutrey, though—the astrophysics man, you know—to see if he could tell us how"—spluttering and crackling—"going to go on. It's a damned nuisance it picked this time of all times to happen."

"How is it"—crash—"how is it with you?"

"Bad. Ordinary radio is bearable, but television stations are having to suspend operations. All you get on the screen is interference. And I mean *all* you get."

This time the noise was like a tidal wave. It seemed to flood out of the speaker and hit Arkwright with almost a physical force. He waited for it to die down.

"There's no future in this," he said wryly. "I'll see if I can pick"—crackle—"pick a time when the spot's not delivering so strongly. Have"—crash—"have someone listen out for me."

"Of course. Incidentally, it seems that practically every ham on five continents who can get our wavelength is listening to us. The U.N. communications monitors are having the devil's own job clamping down on people trying to soup their sets up enough to push their call sign through the Heavyside. I don't know whether they think you're going to send postcards confirming the contact."

Interference was mounting to a steady pulse and surge in the background; Arkwright signed off and stood back from the mike, frowning at the sun.

It looked like a suet pudding, he thought irrelevantly—stuffed with enormous black currants.

He couldn't explore very far from the ship in the time available; however, he had a Geiger counter to carry with him on the off-chance, and a fairly complete and exceedingly compact laboratory at one end of the cabin, so that he could run quick analyses of sample rocks which looked interesting. Any data gained at first hand on the composition of the moon was important, of course—but rocks containing water of crystallisation, for example, might make the difference between a self-supporting lunar colony soon, or never.

The storm of solar radiation boiled slowly towards maximum; he had landed about a week before sunset. He kept wishing that the lunar night would fall, hoping that the setting of the sun would relieve the unceasing interference which built up almost moment by moment.

It was torture to listen to the faint, indistinct voices which reached him from Earth; many times he gave up in disgust, unable to unravel the tangled skeins of sound. He had looked to a constant contact with the people at base to alleviate any tedium which might arise during his stay; there would be very little to do once he had explored his immediate neighbourhood. The instruments looked after themselves, but he had samples of rock to break down in the test-tubes, and when he found what he was looking for, he set up a small solar still to produce water and prove that it could be done.

He went back continually to the radio, hoping to find at least a temporary lull in the racket. When he got the chance, he voiced his frustration wryly to Costello, who tried to cheer him.

" After all, it won't last forever," came the words indistinctly from the crackling speaker. " We've reached the moon once—it doesn't matter tremendously if the data you get has to wait till you come back. There'll be other ships. Incidentally, have I told "—crackle.

" Repeat, please !" shouted Arkwright.

" They've made an appropriation for two more ships," Costello informed him. " And the U.N. has set up an international fund to finance further exploration."

" Quick work," Arkwright started to say. But the speaker spat at him like an angry cat, and after waiting five minutes he gave up.

He knew that the world had been thrown into turmoil by the news of his landing; everywhere, people were clamouring to know more about rockets, about the moon, about himself. Costello had read headlines out to him, and articles in which frustrated popular science columnists waxed poetic over man's conquest of space.

All very fine and large, thought Arkwright. But Columbus the Second was finding that the continual spluttering of the radio was getting on his nerves. He decided that the egoboo could wait.

He fetched out the biological kit which formed part of his equipment, and went out to see if a certain strange stain he had noticed on the rocks could possibly be a living organism. But it wasn't.

The urgent signal came about six hours before sunset; he was away from the ship, still working on the stain, and had just come to the conclusion that it was only a corrosive compound. He shut up the biokit and returned to the cabin.

The words could barely be distinguished through the hum and thunder on the circuit, but he made out enough to tell that it was Costello on the air and that the man sounded in a hurry.

"What is it?" he demanded loudly and clearly.

"We can't get any readings from your spectrographs," Costello shouted back.

"I'm not surprised!" said Arkwright. "It's a scanning transmission, isn't it? Television type?"

"Yes. Can you read a spectrogram?"

"Not without a standard line-chart, I'm afraid. Why?"

"Well, would you go out and try what you can do?"

"What's the hurry? When the sun sets up here, interference should drop off enough for you to get the data."

"That's exactly what we can't wait for. We want a free-space reading of the solar spectrum."

Arkwright was silent for a moment. "I take it you've heard from Dutrey?"

"Yes."

"What's the verdict?"

"He doesn't know yet. But he wants that spactrogram to help him find out."

"All right," Arkwright acquiesced. "Is there anything special you want me to look out for?" He took down a pad and a pencil.

Costello gave him several dozen code numbers; he had to ask for repetitions on many of them. At the end he whistled. "Tell Dutrey not to be silly," he requested. "There aren't that many hydrogen lines in sunlight!"

"In a free-space spectrogram there may be," returned Costello after a pause. "Apparently it'll mean something if tl ere are."

"Okay," shrugged Arkwright. "You're in charge. I'll be as quick as I can—the sun'll be down soon."

He clamped his space-helmet back into position and went outside again.

The spectrographs were four in number; one was focussed on the sun, the others on interesting stars whose spectra offered important

information about stellar processes. Of course, Arkwright thought, I would have put the solar one furthest from the ship, wouldn't I?

He dropped into shadow of the instrument and thrust up the shaded visor before his faceplate to look at the blindingly bright pattern of lines on the visual object-glass. He whistled with surprise as he began to see it clearly.

Dutrey was right; there *were* that many lines.

He set his notepad on his knee and checked the code numbers against the visible spectrum; he ticked off all those Costello had given him as he found them, and added a few more. Something about these last tickled his memory, and he sat back, rapping the pencil against his faceplate.

If he remembered rightly, they couldn't possibly have been there at all.

When he returned to the ship, he was frowning.

"Well?" said Costello with barely concealed eagerness. "What did you find?"

"Everything you asked for and more besides," Arkwright told him, and thought he heard a gusty sigh through the static. "I don't quite know what's happened, but something must have punched the sun right in the solar plexus." He wondered if Costello found the joke amusing. "If I recall aright, some of these lines belong down in the million-degree region. What are they doing on the surface?"

"I don't know," said Costello. "But I hope Dutrey does."

Anything else he might have added was lost in a welter of noise.

Arkwright returned worriedly to the spectrograph and took another careful look at it before the sun finally settled behind the mountains of the crater ringwall. It looked as if the legendary beast reputed to devour it at eclipses had been taking wholesale bites out of it.

As soon as it had disappeared completely, he re-aligned the solar spectrograph to show one of the next group of stars on his list. It was a long job, involving the retiming of the precessing clockwork and the fitting of a larger lens with a longer focus. It was getting bitterly cold even inside his insulated suit before he finished, but he stuck with it, and it was two hours before he got back to the ship.

The solar interference should be masked by the moon to some extent by now, he figured. He raised Costello and was rewarded to find the noise slightly less nerve-racking than before.

"Well, what's Dutrey got to say?" he demanded.

"Have a heart, man! How long do you think he's had the information? Wald of Mount Palomar has been on to us too; I gave him the same news. Seems that the mess it's made of international com-

munications has finally taken people's minds off you. There's the usual hooha demanding why the government doesn't *do* something—"

"I guess there would be," said Arkwright. "Well, let me know what they say, won't you? I'm bothered by that spectrum I saw just now."

He signed off to break out a meal for himself; he ate with his notepad open before him, staring at the symbols on the paper and trying to figure them out. Obviously, there was some explanation for them.

When he finished, he decided to go out and take a look at Earth.

The shining shape of the planet was dazzling because of the brightness lent by air and water; now that the sun was down it stood out in true relation to the brightness of the full moon. Arkwright had been intellectually aware of its brilliance, but seeing it was something altogether different again.

He gazed up at it for a long time.

And then, as suddenly as if a switch had been pulled, a light turned on, the illuminated part of the disc became blindingly—incredibly—bright.

The glare made him cry out and throw up his hand in front of his eyes; a purple after-image burned like a scar on his retinae. It was only when he had blinked uncomprehendingly at it through the dark visor that he realised what might—what *must*—have happened.

He turned and ran up the ladder to the airlock, cursing the slowness with which the mechanism cycled. As soon as the door opened, he tore across the cabin, shouting at the implacable black maw of the microphone.

"Costello! Anyone! Can you hear me? What's happened?"

The voice which came back through a clamour of noise greater than any before was that of a stranger; it was hysterical, raging futilely into the void.

"*The sun's blown up!*"

The pitiless glare of the swollen sun played across the face of the earth like a flame-thrower. Numbly, stirring neither to eat nor drink nor sleep, Arkwright sat and watched it.

For a little while—during the first few hours, while there were still spots on the surface of Earth untouched by the finger of flame—he had managed to patch together a few facts from men who, in the midst of destruction, had remained calm enough to tell what was happening—not caring who was listening, not even certain if there was anyone left to hear them.

They told of fantastic hurricanes devastating continents as the atmosphere of the noon meridian was flash-heated to boil it into wind;

of the surface of the sea steaming and breaking into slow, sullen bubbles as if the bed of the ocean were one gigantic saucepan; of tidal waves roaring up the beach to roll twenty, fifty, a hundred miles inland. They told of acres of summer-dried plain and forest blazing in a moment into flame; of cities crumbling, of people seared to death as surely as by the blast of an H-bomb.

After the first complete revolution the icecaps had gone; the sea-level must have risen enormously. The cold eternal waters of the Great Deeps must have been rising to boiling point by then; there would be no snowcaps left on any mountains, no water left in shallow rivers.

Later, the air was too full of steamy clouds for him to see more than a featureless disc, as blank and barren as the face of Venus.

Looking towards the horizon in the first hour, he had seen the last of the lunar peaks to catch the sunlight glow into sombre red; a few of them had crumbled. Seismic shocks still indicated that on the side of the satellite no man had yet seen, the moon also was being seared by the flaming heat.

He had expected momently that the tide of outflung gas from the sun would lick out and absorb the Earth-moon system—but if that was to happen, it would have happened in the first few hours. As nova explosions went, this was a small one; the expanded frontier of the sun would have engulfed Mercury, perhaps Venus, but no further.

And yet its word was as final as it needed to be. The thermocouple he had with him was a poor instrument for use over a quarter of a million miles; still, he made the attempt, and the dial silently told him that the equatorial temperature of Earth had risen by six hundred degrees.

At last he fell asleep at his post; head slumped back, limbs limp, he dived gladly into the unconsciousness of sheer exhaustion.

After that, time passed for him in a sort of daze. He would look up at the gleaming, featureless ball of clouds and not really remember what it signified; listen to the roar of static in the radio without more than a faint stir of hope that there might be a voice calling somewhere.

He wondered why he himself was taking the trouble to stay alive, and remembered that when the sun rose again, he would be denied the chance.

The long lunar night passed away. When the chronometer told him it was almost over, he donned his spacesuit again, his hands moving over the fastenings as if they belonged to someone else, and left the spaceship to watch for the final dawn. It seemed logical to him to do

it that way, instead of cowering in the useless protection of the ship, or hiding in a cave between the rocks.

Standing on the plain of the *Mare*, he turned his eyes achingly towards Earth again. It was so brilliant in its new disguise of clouds that it seemed like a new giant star in the heavens, and not a world.

He thought of things he had done, places he had seen, people he had called his friends—whom he would never see again. He wished he were a poet, perhaps, to write an epitaph, create a masterpiece for some unknown alien being to find and decipher in a million years, and learn how a race had died : . .

Well, or badly ? He wondered.

And that was the end of Hitler and Napoleon, of Attila and Genghis Khan—so much the better. But it was also the end of Galileo, Newton and Einstein; of Bach and Beethoven, Paganini and Kreisler and Armstrong; of Pheidias, Michaelangelo and Picasso; of Homer and Shakespeare—

How could you simply pick up a pen and write THE END across a story that had lasted two million years ?

He had stood for so long in a trance, remembering, that it was some time before a single fact penetrated his regret-drugged mind, and he looked about him with a start.

The landscape lay in sunlight; long dawn shadows slanted towards the horizon. But he was still alive.

Unbelieving, he turned and looked full at the low, rising sun. It was mis-shapen; it was diffuse, clothed in its own erupted gases, and it seemed larger than before—but it was no longer bright enough to kill him.

After so long a resignation to the inevitability of death, it took him a while to grow accustomed to the idea of staying alive. When he did so, he spent a time in frenzied, joyful shouting, until exhaustion sobered him and he thought what use he might make of his reprieve.

It could only be a reprieve. His release from the bond of Earth was temporary; he could not live out his life up here, without more food, water, oxygen . . .

Perhaps there were people who had lived through the hell of the nova in underground refuges: in deep mines, in H-bomb shelters. *Perhaps.*

There was only one way to find out. He would have to go back.

The face of Earth was changed beyond recognition. The heaving, oily seas; the blasted and scarred grasslands; the ruined cities poking up from newly inundated bays—it was a vision of Inferno, masked by thick, coiling clouds of steam and great black drifts of slowly dispersing smoke.

Flying the spaceship on its glider wings, he looked anxiously down whenever the fierce buffeting of the tortured air allowed, seeking a sign of life.

But what kind of life could have survived the week-long storm of heat and radiation which had poured down from the sun?

He chose a landing ground on what had been a swamp; the ground had been parched into smooth dry mud, marked only by the remnants of a few scattered trees scorched into charcoal. Fantastic electrical storms raged on the horizon; he did not want to fly on further and face them.

It was good, as landings go; he rolled a thousand yards expecting every moment that his wheels would find a fissure and drop him crashing to the ground, but he halted safely.

As soon as he could leave the control panel, he went to fetch his chemical kit and carry out some tests. They dealt the final blow to his hope that men might have survived.

There was no oxygen in the air; foetid water vapour and carbon dioxide in incredible abundance from the gigantic burning which had taken place made up the balance with the nitrogen and hydrogen. Without oxygen, there could be no animal life; without animal life, vegetation was doomed.

He put on his spacesuit and plodded to the edge of the sea which glistened leadenly a mile away. It had been fifty miles away before the icecaps melted—if he had recognised his location correctly; the coastlines were so changed it was difficult to tell.

The sea rolled steaming against the beach; it was full of carrion. Fragments of fish were scattered by it one moment and taken up the next. He tried its temperature; it was within fifteen degrees of boiling, even now.

Without hope, he exposed some culture plates, thinking at least that airborne spores might be revealed by them. Sitting and waiting for them to show results, he looked out towards the steam-masked skyline.

"And the waters prevailed upon the Earth," he murmured. It must have been like this in the beginning—the air full of carbon dioxide from the dying volcanoes, and of hydrogen and nitrogen, and steam from the cooling oceans. And both continents and oceans alike barren of life.

"This has all happened before," he told the world. "And every living substance which was upon the face of the ground was destroyed."

Where did that come from, anyway? He thought a moment, and remembered. Of course: from the description of Noah's flood.

Had that flood really happened? He wondered. He knew that the story was widespread—almost too widespread to be a legend. The

Jews had called him Noah; the Greeks, Deucalion; the Babylonians, whose version was the most ancient of all, had called him Ut-Napishtim. Yes, that had been a great flood—but this was a more final one. Noah had carried with him his family, and representatives of every species of bird and beast and insect; he was ready to start over.

Whereas he himself—and he looked at the culture plates to find them barren—was alone.

Later, before his laboratory bench, he faced the fact. The sea was sterile; the air was unbreathable; the land was barren. Hs was not only the last human being; he was the last living creature on Earth.

He picked up one of the culture slides again listlessly, and gave an incredulous cry. A tiny colony of bacteria stained its surface.

Which medium had he exposed that one to ? Feverishly he consulted his notes, and drew back in disappointment. It was one of the first; it had been blank when he—

It had been blank when he brought it into the ship.

But he was not the only living creature on Earth.

And out there things were as they had been in the Beginning, when life appeared on Earth: the sea sterile, the air unbreathable, the land barren—but *waiting*.

Smiling, certain now of what he must do, Arkwright got to his feet and opened the airlock.

And Noah went forth, and his sons, and his wife, and his sons' wives with him.

Every beast, every creeping thing, and every fowl, and whatsoever creepeth upon the Earth, after their kinds, went forth out of the ark.

John Brunner.

New Space-Age Weekly

We welcome to the British publishing field the new weekly space-age paper *Rocket*, designed for all ages from 9 to 90 and containing features on science fact, fiction and fantasy. Edited by air-ace Douglas Bader, it numbers amongst its experts Commander Kunge-Bateman, a specialist in the realm of space travel and guided missiles ; Ley Kenyon, an expert on aqua lung diving who is also a fine artist ; and in an advisory capacity, John Carnell, editor of *New Worlds*.

Author William F. Temple commences a humorous series of stories concerning a Science Academy of the future, where anything can happen—and does.

In our February issue (No. 44) Donald Malcolm dealt with the legal entanglements involved in placing satellites and space stations in orbit round the Earth. This month he moves to the Moon and discusses the problems of astronomy from that almost-airless satellite.

LUNAR OBSERVATORY

By Donald Malcolm

When men reach the Moon, probably some time during this century, the way will be open for great advances in the sciences, especially astronomy.

An astronomer on our satellite would be in his glory. What are some of the advantages he will gain by having a lunar observatory? What size and type of telescope will he use? Will he solve the riddle of the canals of Mars and shed new light on the origin of cosmic rays? Will he be in a position to deduce how our solar system was born? The solutions to many questions might be forthcoming when the lunar observatory is established.

It has always been inferred that there would be one great advantage of observing from the Moon—the satellite has no air. Any schoolboy knows that. But that widely held belief is now open to doubt. The experts cannot see eye to eye on this facet of the Moon.

The occultation of a bright star by Luna seems to give the bias to the advocates of an airless Moon. When the star passes behind the darkened limb of the satellite, it disappears abruptly. The twilight effect, caused by the light-scattering properties of an atmosphere, is entirely absent. On the other hand, competent observers have recorded variations, due to mists, in Plato, a crater in the Moon's 2nd (North-East) Quadrant. To be on the safe side, it would be wise to grant the Moon a very tenuous atmosphere.

This virtual lack of air will be a great aid to a lunar observer. To appreciate this fully, let us consider what a bugbear our own atmos-

pheric mantle is to astronomers. Despite the inescapable fact that they have to breathe air, astronomers hate the stuff. The air is very turbulent, although it might not seem so to us, and stars twinkle as a result of this turbulence.

Suppose the astronomer wants to photograph some fine detail on, say, Mars. Having chosen a good night, he turns his telescope and camera towards the planet and proceeds to build up an image on his plate. However, it is very likely that, when he develops the negative, he will find that all the fine detail has been blurred and distorted, ruined by the continuous shift and shimmer of the air. For this reason, most observatories are built on mountain summits, so that the bulk of the atmosphere lies beneath them. Even then, astronomers still have to contend with the problem.

On the Moon, the sky will be black—the little air there might be is insufficient to scatter the sunlight. (It is interesting to note here that the Martian sky will be more of a purplish-black hue). In consequence, the true nature and position of the stars will present itself. The Earth's atmosphere curves the light of any star passing through it. This is known as refraction. As a result, stars are seen a little higher in the sky than they actually are. The effect on stars near the horizon, where the atmosphere is most dense, is more marked than on stars at high altitudes. A star overhead will be more or less in its true position. 5,000 or 6,000 naked-eye stars can be seen from Earth, but the total visible from Luna will be much higher. The differences in colour will be obvious, while the friendly twinkle will be absent. Replacing it will be a steady, frozen glow.

The setting up and establishing of a lunar base promises to be no easy task. At first, the astronomer will have to content himself with a telescope of about 15 or 20-inch aperture. Most likely, it will be a reflecting telescope, i.e., one that uses a mirror to collect the light. The rival of this type is the refractor which utilises a lens for light gathering purposes.

Now—why a reflector? To answer that one, let us have a closer look at the two types of instrument. In a reflector, the main mirror is placed at the bottom end of the telescope. The light is reflected from the main mirror to a secondary mirror which in turn, sends the light to the observer's eye. This is the Newtonian reflector where the eyepiece is situated at the side of the telescope. Coude's arrangement is similar to Newton's, only it uses a third mirror. The third main type of reflector is attributed to Cassegrain. He used a main and a secondary mirror, but the light reflected from the latter passes to the observer through a hole in the main mirror. The advantage of any reflecting telescope is that the main mirror can be supported

over its entire area. The mirror of the 200-inch at Palomar is supported by a honeycomb structure, as the one being most suitable for the task.

When we come to deal with the refractor, we have a very different proposition. The lens of a refractor, placed at the top of the telescope, can be supported only round the rim. Admittedly, there is no trouble with small refractors, but when a large lens, like the 40-inch on the Yerkes telescope, is used, it is found that the almost unsupported glass shows a tendency to bend under its own weight which in turn causes a distortion of the image. All refractors have a closed tube to exclude stray light rays and large refractors require a strong, heavy tube to support the lens as much as possible.

A large reflector can get along fine with only a skeleton framework, as is found on the 100-inch Hooker telescope at Mt. Wilson. Weight, then, will be a governing factor in the choice of instrument. The problem of transporting even a 15-inch mirror to the Moon will be a difficult one to solve. The early spaceships won't carry a very big payload. The mirror would have to be securely packed and cushioned to avoid any possible damage. It would be galling indeed to open up the package on the Moon only to find that the valuable mirror had cracked en route ! Once there, however, a very light framework would suffice, as Luna has a low surface gravity.

On Earth, astronomers don't derive the full benefit of their telescopes. On the almost airless Moon, a telescope could be used to the full limit of its magnification. Suppose F is the focus, A is the object-glass (the main lens) and E the eye-piece (secondary lens). The magnification depends on the ratio FA : FE. A and E represent the centres of the lenses. To achieve a greater magnification, a small focal length must be used (FE).

Because of the comparative nearness of the Moon, much is known about its surface conditions. The 200-inch can bring the satellite to within an apparent distance of 18 miles. Just as a traveller going to Austria, for example, would gather information beforehand (this is a wise traveller) so astronomers have collected data on the Moon's conditions, with the secondary objective of giving astronauts a fair idea of what they will be up against. Once he is established on the Moon, man, ever insatiable, will turn his eyes to the planets, especially Mars, as the red world is the most likely abode of life. Here again, the astronomer will prove his usefulness. We saw how the turbulence of an atmosphere blurs the image on a plate. No such snag is evident here. He can focus his telescope on the planet and take his time in building up an image.

Will the mystery of the Martian canals be solved ? It is very likely, but what will the answer be ? Are the canals artificial, the work of

intelligent beings striving against a world short of water, as Percival Lowell believed or are they merely great cracks in the arid Martian surface? Whatever the ultimate explanation, explorers will be forearmed with a good knowledge of the terrain of Mars.

Astronomers are severely handicapped not only by the presence of an atmosphere but also by the comparatively rapid spin of the planet (Jupiter, for instance, rotates once in about 10 hours). The night is short and the seeing conditions are very seldom to their liking. Therefore the period of observation is cut down to a few hours before daylight comes on the scene again.

The gravitational attraction of the Earth is so powerful that Luna turns once on its axis in the same time as it takes to revolve once round the Earth. (Mercury has the same relationship with the Sun, the period of revolution and rotation being 88 days). It follows that the Lunar night is equal in length to about 14 terrestrial days! The astronomer wouldn't have to worry about the encroaching day or the uncertainties of atmospheric conditions.

Perhaps the greatest headache to astronomers is this: how was our Solar System born? A good estimate, deduced from radioactivity and other sources places the age of the Earth at something like 3,000 million years. Most authorities believe that the other planets came into being at the same time as the Earth. The giant telescope on Palomar has penetrated the heavens to a depth of some 2,000 million light-years. With the advantage of a telescope which can be used to its full extent, Lunar astronomers might one day see right back to the beginning of time and creation. The riddle of the recession of the galaxies might be solved. Is the red shift, denoting recession, real, or does light redden with age, thereby denying the theory of the expanding universe? In the journey back through time, the birth pangs of a star might be witnessed. Maybe the star will be in collision with a passing star; maybe the star will lose its binary companion and in the process, give birth to proto-planets.

The study of the Sun itself from the Moon might help to give some indication of how planets are born. The Sun is one of the sources of the so-called cosmic radiation which might be charged particles that attain speeds approaching that of light. Astronomers want to know just what part cosmic rays play in the all-over scheme. The corona, Sol's beautiful halo, and the many prominences will come in for their share of study. These phenomena can be observed from Earth without an eclipse being necessary, but, from the Moon, they will be seen as they really are. The spectroscopist will be hard at work here without having to resort to the use of either the coronagraph or the spectro-

heliograph. Another aspect of the Sun that will provide plenty of material is the relationship between the intensity of sunspots and disturbances in the Earth's magnetic field, giving rise to the Aurora Borealis. The behaviour in space of the particles thrown out by the solar flares will be studied.

The Sun is, of course, the nearest star to us and by studying it, astronomers hope to learn more about the stellar universe, how other suns are born, what sequence they pass through in their lifetime and what their final fate will be. These and many other stellar secrets may be revealed when there is an observatory on the Moon.

The largest reflecting telescope on Earth is the 200-inch Hale instrument at Mt. Palomar, California. It is a marvel of engineering and optical skill and it weighs, with its mounting, all of 500 tons. Apart from the stupendous task of casting, grinding and polishing such a large block of glass, an observatory had to be transported to the site and masses of electrical and electronic equipment installed. All this was no easy task, to make an understatement.

Hale, whose genius and driving force lay behind the construction of the 100-inch and the 200-inch, actually dreamed of a successor to the latter—a 300-inch telescope. What are the chances of such a project being realised? Consider the block of glass that would be required. Casting the block would be extremely difficult as the people who cast the 200-inch mirror well know. Once cast, the block must then be ground so that the surface conforms to a mathematically correct parabolic curve. Step number three involves painstaking polishing with frequent tests to ensure that the curvature is correct. No dust must be allowed to insinuate itself between the surface and the polishing pad. One scratch, one burst air bubble—and the work would be ruined.

Besides all this, high mountains in suitable latitudes are rather scarce these days. It is doubtful if Palomar itself could be used. Any necessary blasting might cause damage to the 200-inch which must remain rigid on its mountings to within a very small fraction of an inch. Reluctantly, it seems that Hale's dream will never be fulfilled.

Let us move back to the Moon, keeping in mind that the value of the satellite's surface gravity is only one-sixth that of Earth's. Would it be possible to build, say, a 100-inch reflector at the Lunar observatory? Providing all the necessary tools and manufacturing equipment were available, this, or an even larger aperture, is a possibility because the Moon's lower gravity would enable a much flimsier structure to be employed. Where is all the material to come from? The answer to that lies in the fact that many of the Earth's elements are present in

the Sun. It is generally thought that the planets and moons were in some hitherto unknown manner born out of ejected solar material. So the Moon is almost certain to contain most, if not all, of the elements found on Earth.

In time, the Lunar base will have the resources to sustain itself and make the project feasible. When a Lunar colony is established, it will be situated underground where a more equable temperature is believed to exist. Full sunlight raises the temperature to about 212°F, while a shadowed area might be in the deadly grip of a temperature of —200°F. Here we see the effect of the lack of a blanketing atmosphere. Also, meteors would cause a bit of damage. The observatory would be temperature controlled and the dome provided with a double skin, the outer one acting as a meteor bumper. Possibly a large refractor might be constructed as part of the observatory's equipment.

One of the aspects of astronomy which would progress by leaps and bounds in a lunar observatory is stellar photography. The instrument tailor-made for this job is the Schmidt camera telescope. First, a word about Schmidt himself. He was a character, to say the least of it. For a while, he devoted his talents to the manufacture of bombs, at which he proved only too successful. Luckily for him, when he recovered from a potent explosion, he found he had blown an arm off and not his head. This was a fortunate break for science, too. Making light of his handicap, he made a habit of collecting old bottles and producing perfectly good lenses out of their bottoms ! His crowning triumph was the invention of a camera-telescope which used a spherical mirror. By fitting a correcting lens, he eliminated the two main faults peculiar to reflectors before the light even reached the mirror, viz., astigmatism and coma effect.

Astigmatism, a blurring and distortion of the image, arises because not all the light rays falling obliquely on the mirror can be properly focused. One or two rays go astray. In the coma effect, stars at the edge of the field of vision actually develop tails and look like comets. Only the stars in the centre of the field show up as well-defined points of light. These faults mean that reflectors have comparatively small fields of vision. The effective field of the 200-inch is about half the apparent angular diameter of the Moon—$\frac{1}{4}$° or 15ft. of arc ! The beauty of the Schmidt camera-telescope is that it has a wide field of vision and it would be of great value on the Moon.

Until the Moon is reached, astronomers will strive with the telescopes at their disposal to unravel the secrets of the heavens. This year, for instance, at the opposition of Mars, they hope to turn the 200-inch on the red planet. They are not waiting for spaceflight.

Donald Malcolm.

It would be an intriguing thing to find an uninhabited planet complete with a cultural and technological set-up waiting for someone to investigate it—but quite another problem entirely trying to discover why the original inhabitants left without trace or reason.

CONTROLLED FLIGHT

By Dan Morgan

Illustrated by HUNTER

The engine room was a mess. The meteor had passed right through the hull and out the other side, leaving two jagged holes through which the star-speckled blackness of space was visible. In the process it had sliced away half the main drive generator. Gorman surveyed the neat cross-section of its complicated interior and cursed feelingly.

"How is it?" The voice of Teal sounded in his helmet speaker.

"Rough," replied Gorman. "Main drive is completely wrecked. The only thing I can do is connect up the auxiliary, but it won't give us much speed. How much time have we got?"

"About six hours, at the most," said Teal. "I can see Walker's ship in the rear view screen now, and he's coming in fast."

Gorman licked his dry lips. It would take about an hour to unship the useless generator and instal the small auxiliary. But what was the good? They could not hope to outdistance the Interstellar Police

ship, even running it at maximum load. The chase had lasted three weeks, through a dozen solar systems. Once they thought they had lost him, but Walker was one of the Ganymede Conditioned agents, a single-minded hunter, no longer quite human. He had been a criminal himself once, like many of the others, but they had taken his soul and given him the instincts of a bloodhound.

"It's no good, Jim, we're finished," said Gorman. "What's the use of prolonging the agony?"

"Get to work, you big slob!" Teal's voice cracked like a whip. "Even at a quarter speed we can reach McCann V in two hours."

Gorman moved forward and started to unbolt the generator automatically. He was used to obeying Teal. Although they were partners,

Teal was the idea man, the brains of the outfit. Gorman's talents were more on the physical and mechanical side.

"What's the good of that?" he grumbled as he worked. "McCann is a Federation colony. Walker will be on our necks howling for an extradition order soon after we've landed."

"Maybe, but that's better than sitting around here waiting to be picked up," said Teal. "Don't forget, we're pretty near the frontier here. He may not find it so easy as you think."

Gorman quickened his pace. Teal had a point there; some of these outer colonies had their own ideas on the administration of Federation Law, composed as they were of a high percentage of rugged individualists. And the central government were loath to antagonize the members of what was at best a loosely knit organisation, by interfering too much in their internal affairs. If anybody knew how to take advantage of such a situation, it was Teal, with his smooth line of talk.

"I don't get it," said Teal, his small body almost buried in the foam cushioning of the acceleration couch. "Why should they go to the trouble of putting up dirty big orbital stations like that, if they're not going to challenge incoming ships?"

Gorman grunted, he was fully occupied with the task of landing the ship in one piece, using only the power of the auxiliary drive. A quick preliminary survey had told them that there was only one large city on the planet and a few isolated prefab settlements. Gorman was headed for the landing field on the outskirts of the city. It was obvious that there they would find the centre of government of the colony, and perhaps the necessary materials to refit the ship.

Sweat stood out on Gorman's temples as he watched the row of dials in front of him. His stubby fingers flew over the controls. This he was good at, he could take a ship through hell and back against any living pilot.

But skill was not enough. Fifty feet from the fuzed rock surface of the landing field the overloaded auxiliary blew out and the ship dropped like a stone. She landed with a rending crash and heeled over on her side.

Gorman recovered consciousness in a pitch black control room. Trying his aching limbs one by one he decided that there were no bones broken and commenced to unstrap himself from the acceleration couch.

He peered into the darkness. "Are you all right, Jim?" There was something between a whimper and a groan as his partner stirred. Gorman felt his way over to the other couch and helped Teal to his feet.

" What happened ?" groaned the little man.

" The auxiliary wouldn't take the strain of a landing," said Gorman. " Unless we can get a complete power unit we're stuck here. Come on, let's go and take a look outside."

They lurched across the sloping floor to the door at the rear of the control room. Gorman managed to wrench it open after a struggle.

They stood, blinking in the sunlight that poured in on them. The ship had broken her back in the landing. The stern half, crumpled like an empty can, lay several yards away, completely torn away from the control compartment. A dozen main drive generators would not take her into space again, she was a total wreck.

Gorman stepped down onto the landing field and looked around him morosely. " What kind of a port is this anyway ? Where are the bloodwagon and the fire crew ? They should have been here by now."

About five hundred yards to the right was the long low structure of the control building, with its characteristic crown of radar antennae. A number of runabouts were untidily parked in front of the building, but there was no sign of the kind of activity that should have been prompted by a crash landing.

" How should I know ?" Teal's thin face was still pale from the shock of the landing. " We'd better walk over and find out what's going on." He headed towards the control building.

" I don't like it," said Gorman at his elbow. " If this is the main field of the colony, where are the ships ?" He shivered as a cold wind tugged at his light clothing. The blackened rock stretched for over three quarters of a mile on every side of them, but apart from the wreck they had just left there was no sign of anything resembling a space ship.

" In the Gazetteer it said that the colony had a population around fifty thousand," said Teal. " That would mean that they wouldn't have a lot of people to spare for loafing around a landing field waiting for the kind of traffic they are likely to get in a frontier system like this."

The door of the control building opened at a touch and they walked into the foyer. The place was as deserted as the field outside. A crudely painted notice board leaning against the far wall caught Gorman's eye. He walked over quickly, a chill sensation in the pit of his stomach.

"A to H queue here for Evacuation Ship," he read aloud. " Looks as if that traffic you were talking about was strictly one way stuff." He turned, his face grim, and walked along to where Teal was standing looking at another notice. The board said : *Do not panic, there are ships enough for all.*

"That's a laugh," said Gorman, thinking of the wreck. "We couldn't get off this planet in a hundred years, the way we're fixed. And if they evacuated the chances are that they had a pretty good reason. What do we do now?"

"You worry too much," said Teal with surprising cheerfulness. "Colonies have been abandoned before—what about Hickey XV?"

Gorman knew all about Hickey XV. A system rich in easily workable radioactive ores had been found a few light-years further out and the whole population of Hickey had pulled out in a get-rich-quick scramble. But there had been other cases, not so pleasant to think about.

"And what about Rarus?" he asked sombrely.

Teal made a gesture of annoyance. "Oh, forget it, Gorman. Whatever it was that made them leave may have died down by now."

"That's what they thought on Rarus." Gorman shuddered. "But fifty years later every one of the investigation team died of the same thing."

"Look at it either way, we're stuck here," said Teal contemptuously. "But I certainly don't intend to worry myself to death wondering what virus is moving in on my bloodstream." He walked out of the building and boarded one of the runabouts. Gorman followed him unhappily, a host of horrible possibilities passing through his mind in rapid sequence.

"What are you going to do?" he asked.

Teal pressed the starter button and the runabout's motor purred into life. "I'm going to look the city over. Walker is bound to follow us down here sooner or later, and when he does I want to be ready for him. Or maybe you'd rather wait here and give yourself up?"

Gorman clenched his big fists. One of these days he would tear the arrogant little swine apart, but right now he did not relish the prospect of being entirely alone. He stepped aboard.

The runabout rolled through the unattended gates of the landing field and out onto the deserted, well-paved highway that led to the city. They were soon amongst the neat buildings of the residential quarter, typical colonial dwellings, each with its own little patch of garden in which a few preciously hoarded Earth-type plants competed with the rank local varieties. Some of the house doors stood open, as if awaiting the return of an occupant.

Gorman frowned. "This place gives me the creeps, everything looks so darned normal."

Teal glanced at him briefly. "Maybe they just got tired of the view."

The road, which was now flanked by shops, led them into a square. Opposite them stood a tall building in shining white concrete.

"This looks like the hub," said Teal. He halted the vehicle and started to walk up the steps leading to the entrance of the building.

Their footsteps echoed in the great empty hall as they moved across to the reception desk. On the wall behind the desk was a gold lettered directory board to the building. A few yards to their right was a row of elevators.

Teal studied the board for a moment. "President of the Republic of McCann V," he repeated aloud. "We should find out something in his office." He headed for the open door of an elevator. "Come on, it's on the fifth floor." Gorman followed.

"Man! this is really a set up," said Teal appreciatively, as they entered the spacious office.

The President of McCann V was obviously a man who believed in keeping his finger on the pulse of his colony. One forty-foot wall of the room was entirely covered by a mass of vision screens, beneath which was installed a corresponding amount of electronic control gadgetry.

"Take a look at that stuff and see if it's still in working order," said Teal. He headed for the large desk which stood on the other side of the room by the window, and started skimming through the papers that lay on its polished top.

"Whatever it was that made them leave here, it wasn't an invasion," said Gorman, his hands moving over a control panel. "Three of these screens are hooked up to the orbital stations we saw as we came in. It looks as if they're armed to the teeth, and operated from this room." He gazed admiringly at the elaborate missile control units. "With an outfit like this you could hold off the entire I.P. fleet."

He switched on the satellite vision screens one by one and noted with satisfaction that their pilot lights glowed into life immediately. "Found anything?" he asked, turning.

"There was a sheet headed *Emergency Evacuation*," replied Teal. "But it was just a list of available ships correlated with population statistics. I suppose they didn't consider it necessary to state exactly *why* they were evacuating—or maybe they just didn't like to talk about it." He opened a drawer in the desk and pulled out a sheaf of printed papers. "This looks interesting."

Gorman walked across quickly and looked over his shoulder. "What have you got?" he asked eagerly.

"A copy of the constitution of the colony," murmured Teal, engrossed.

Gorman grunted. That was the trouble with Teal, always figuring out legal angles and acting smart. It was useful sometimes, but in a situation like this direct action counted more.

The vision screens were glowing now, but their images were very blurred. Gorman adjusted the definition control on board number one. A view of space from the inner satellite filled the screen.

Out of the corner of his eye, he noticed a red light flickering on and off underneath screen number three. There was a prickly feeling at the back of his neck as he moved the control. A ship was approaching the outer satellite fast, and as the image increased in size he recognized its familiar I.P. lines. Walker was coming in to get them.

Gorman slapped a horny fist into his big palm. One well-placed shot and they would be rid of the swine. Do it now, without any warning, before he had a chance to put up his defence screens.

His hands flew over the satellite's missile controls, setting up a broadside that would reduce the I.P. ship to a cloud of radioactive dust. Walker was reducing his speed now, falling into a sympathetic orbit with the satellite. The image of his ship almost filled the screen now. Gorman aligned the remotely controlled firing ports. It was too easy.

A loudspeaker beneath the screen broke into life.

" Interstellar Police Ship AB53 calling McCann five. Request permission to land and extradite criminals who landed on your planet two hours ago. Please confirm."

Gorman grinned, and sent his reply. He pulled the firing lever which would send a dozen deadly missiles homing on the I.P. ship. Standing back, arms folded, he waited for the explosion to become visible on the screen.

" What are you doing ?" said Teal, quietly, coming up behind him.

Gorman's eyes were fixed on the screen. " You'll see in a minute," he said. The impact must come any second now. He tensed himself in anticipation.

But the outline of the I.P. ship did not waver.

Teal looked at the missile control panel and shook his head. " No, Gorman, no . . . You lack subtlety, my boy. Those satellites are a lovely job, but I wish you'd let me do the thinking. I was reading an interdepartmental memo about them just a few minutes ago."

" What do you mean ?" Gorman turned angrily.

" Just that they hadn't got them finished," said Teal, calmly. " They're just so much window dressing at the moment; the senate wouldn't grant the defence department the necessary fissionables to equip them with missiles, because all available materials were needed for industrial development. It's all in the memos on the desk. As a

matter of fact, they had just located a new deposit and started to open it up."

Gorman shrank visibly. "Then we're sunk," he said hollowly. "How can you stand there looking so darned smug, when there's nothing to stop Walker coming down here and picking us up?" The voice of the I.P. agent still rattled in the loudspeaker demanding attention.

Teal grinned like a particularly disreputable stoat. "Did I say that? Leave this to me." He peered at the control panel. "What do I do to talk back to Walker?"

Gorman pointed to the transmission switch. "You're going to *talk* to him?" he asked. He was out of his depth and sinking fast.

"Of course." Teal picked up the microphone. "Hallo, Captain Walker, this is McCann Five," he broke in on the agent's tirade.

"What's going on down there?" barked Walker. "Who am I talking to?"

"This is the president's office," said Teal calmly. "We are fully aware of the Extradition Clause in the Federation Agreement, and can assure you that this colony adheres most strictly to its principles." He made it sound cold and official.

"Have you gone crazy?" whispered Gorman urgently.

"Thank you," said Walker, in a more moderate tone. "Then I take it that I have your permission to land and extradite the two criminals Teal and Gorman?"

Teal placed his hand over the microphone and turned to Gorman. "Is this the vision hookup?" he asked, pointing to a switch.

Gorman nodded. "But don't be a fool. You might bluff it out with sound alone—why spoil it?"

"But I'm not bluffing," said Teal. He pulled the switch confidently. A moment later the hard-etched face of Walker appeared in the small screen of the communicator.

"Teal! What the devil are you doing there! I was speaking to the president's office."

"You still are, Captain." Teal showed his small, even teeth. "*I* am the President of McCann Five."

"Don't waste my time," said Walker. "Whatever you're trying to pull, you won't get away with it. Who is in charge there?"

"We are." Teal shrugged his slight shoulders. "The colonists must have left some time ago; there's nobody on the planet but Gorman and I. If you don't believe me, take a look at the landing field—ours is the only ship there."

Walker moved out of range of the screen for a moment. "Colonists or no colonists, I'm coming down there to get you," he snarled, when he returned.

"No, Captain, I don't think you'd better do that." Teal held up the papers he had been clutching. "See this? It's the constitution of the McCann colony. Nothing special about it, just the standard Federation approved document. But under the circumstances, let me draw your attention to paragraph fifteen, section five."

The down-turned lines at the edges of Walker's mouth deepened. "Are you *sure* that you are the only humans on the planet?"

"Let's put it this way," said Teal smugly. "You'd have a helluva job to prove we're not."

Walker regarded him in silence for a moment. "You conniving little rat," he said at length. His image faded from the screen.

"Will somebody please tell me what's going on?" pleaded Gorman.

Teal grinned up at him. "I expect that right now our friend Walker is calling his area base for confirmation. He knows I'm right, these I.P. men are fully indoctrinated with Federation law, but he'll have to make quite sure that there's no loophole."

"Don't double-talk me, you sawn off blabbermouth." Gorman was tired of being out of the picture. "*What* is Walker confirming?"

"Paragraph fifteen, section five, of course," said Teal. "If you used your head for something other than a battering ram you might know what I'm talking about. Paragraph fifteen states that the president and vice-president of a colony are to be considered special exceptions to the Federation Extradition Agreement. It was introduced many years ago, after the Centauran War, by all the colonies, to curb Earth's imperialist ideas and stop her interfering in their internal politics."

Gorman slapped his fist into his palm. "So they can't extradite the president. Who cares? What about us?"

Teal shook his head patronisingly. "Don't you even know that according to Federation Law, *you and I* are the president and vice-president of McCann Five? As the only two human beings on the planet we succeed to the posts automatically. Get it?"

Gorman's fear and anger were sloughed away as he considered Teal's words. "Jimmy boy, you're a genius!" He walked over grinning hugely and shook his partner by the hand.

"I try," said Teal, with no suggestion of modesty. He walked over to a door on the other side of the room and opened it. Beyond lay the sumptuously furnished rooms of the presidential suite. "Well, we might as well make ourselves comfortable."

Gorman followed him, frowning. "It's just occurred to me—how are we going to get off this planet?"

Teal was trying the springing of a large divan appreciatively. He looked up at his partner. "Really, Gorman, there are times when your lack of vision amazes me. Why should we want to leave? McCann Five in effect *belongs* to us, it's the greatest set up ever. We can make the laws and run the place any way we want."

"I don't see what good that's going to do us—there aren't any people," Gorman pointed out.

"Not at the moment," said Teal. "But what's to stop us putting out a well-worded invitation on sub-etheric? There are a lot of people who would like to get away from the petty restrictions of some of the Federation colonies and live on a planet that's wide open."

Gorman opened an intricately carved box and helped himself to one of the ex-president's cigars. Teal painted an attractive picture, but there could be snags. "Are you sure this legal gimmick of yours is okay?" he asked. "And what about the *other* colonists, the ones that left?"

Teal frowned. "That's the only thing I don't like about the whole business. I'd feel a lot better if I knew exactly why they left, but whatever the reason was, we're stuck here for the time being and I intend to make the best of it."

Gorman's fears surged back again. "I keep thinking about Rarus," he said gloomily.

Teal stretched himself out on the divan and yawned. "No, I don't think it was a disease. There's no mention of it in the Health Department reports I saw on the president's desk, at any rate." He yawned again. "Relax, Gorman. It must be thirty hours or more since we had some sleep."

Gorman shrugged, perhaps Teal was right after all. He strolled over to the window, savouring the aroma of the cigar. The president's cocktail cabinet was noticeably empty and he felt the need of a decent drink.

Dusk was falling over the city. As he watched, the street lights and the shop windows flashed into life. The reactor which supplied power to the city would probably go on working for many years without the attention of human hands.

Gorman licked his dry lips. Straight across the road from the government building he could see a liquor store, its windows stacked with bottles. It struck him that he was a fool to hesitate. Why not go down and help himself?

" I shan't be long," he said, heading for the door. " I'm just going to buy myself a drink." Teal waved sleepily.

Gorman took an elevator down to the ground floor of the building and walked across the street. The door of the liquor store was locked. But this was the work of a moment for Gorman; no finesse was required under the circumstances. He smashed the glass panel with his heavy boot, and reaching through, let himself in.

He opened one of the bottles that stood on the counter and tasted its contents. It was a passable white wine with a small sharpness that tingled on his palate. He nodded in satisfaction as he walked out of the store, bottle in hand.

Halfway across the darkening street he froze. His entire body had suddenly become paralysed. Panic welled up from his stomach as he realised that the questions he had been asking ever since landing on McCann were about to be answered. He tried to move his legs, but they did not belong to him any more. His arms were the same; even the small muscles of his face and eyes.

He stood there like a graven image, a prisoner in his own rigid body. The disease, if that was what it was, had not affected his power of thought. The top of his head tormented him with a burning ache.

" *I thought they were all gone*," said something inside his head.

Not really words, but Gorman was aware of the sense of the communication. He was also aware that it was not directed towards him. His capacity was merely that of an eavesdropper and he was only able to receive one half of the conversation.

" *Yes, a big one, strong and absolutely undamaged. I've just taken control of it.*"

Gorman's body started to run forward with shambling, uncoordinated movements. He tried to stop it with an effort of will, but it was no longer in the true sense *his* body. The imprisoned spark of awareness that was his ego whimpered soundlessly.

" *It's struggling a little. But I can control it easily, it is the same type as the others.*"

Gorman was moving faster now, running down the deserted street. Unable to control even his eyes, his vision was blurred. He did not see the traffic control robot until he was almost on top of it.

" *Do you think they really are intelligent? I don't see how they can be, with this great clumsy body to carry around all the time. All very well for sport, but imagine living inside such a gross object constantly . . . No, I haven't tried to probe its thoughts they die so easily if you do that. I'm just sitting here in the motor centres, driving.*"

Gorman tried to stop himself, but his racing muscles did not respond. He hit the hard steel covering of the traffic robot with a sickening impact. His consciousness flickered for a moment, but his body stayed erect, turned and started running in another direction. He could feel blood trickling down his face from his pulped nose, his whole body aching with pain.

"*Careless of me. I don't want to break it too soon . . . There may not be any others.*"

But the nightmare had only begun. Gorman, fully conscious but impotent, was forced to witness and feel the pain as his body was put through every conceivable kind of exertion. The thing that was controlling his body seemed to have no conception of the limitations of human flesh and blood; or rather, it seemed to be intent on discovering them by a process of trial and error. A hundred times the body of Gorman tried to climb sheer walls, walk through solid objects and other impossibilities, being battered and bruised in the process.

Gorman's mind floated untethered and gibbering on a sea of white hot pain. At last his dust-seared eyes told him that the darkness was retreating into dawn.

"*I must leave it now, before the radiation becomes too intense.*"

Abruptly, Gorman's muscles were back under his own control. He slumped to the ground.

It was broad daylight when he grovelled back to consciousness. Pain shot through tortured nerves as he moved an arm experimentally. Every bone in his body ached and his face was stiff with caked blood. He wiped the film of dust from his eyes and looked down at his torn and filthy clothing.

He heard a groan behind him and rolled over, almost losing consciousness again with the effort. Teal lay on the pavement nearby, his small body a ragged wreck.

"They got you too," croaked Gorman.

Teal opened his eyes, breathing in painful sobs. "Yes . . . I came out to look for you."

"What are they?" asked Gorman, shuddering at the memory of the night.

Teal was on his hands and knees now, sweat pouring down his thin face, making white streaks in the filth that covered it. "They're noncorporeal beings, things of pure intelligence. The colony had probably been established for years before they even noticed it. And then they must have discovered that they could take over a human body and drive it like we do a machine. Last night was sport to them, an enjoyable novelty."

Gorman dragged himself to his feet and stood, swaying drunkenly. "Sport! Now we *know* why the colonists evacuated the planet. But why did they let us go, once they were in control of us?"

"As far as I can understand it, they don't move around much in the daytime. The radiation of the sun probably affects them." Teal staggered, steadying himself against a nearby wall.

Gorman looked at their surroundings; they were at the foot of the steps leading into the government building. "We've got to get out of here," he said, placing a shaky foot on the bottom step. Teal nodded in agreement and followed him.

Dragging bodies that threatened to collapse with every movement, the two of them finally arrived back in the president's office. Gorman made for the communicator controls.

"What are you doing?" asked Teal sharply.

Gorman leaned against the panel, fighting the fatigue that clogged his muscles. "If we're lucky, Walker will still be in orbit. I'm going to ask him to come down and get us—the Reconditioning Centre couldn't be worse than this."

"You give up too easily, Gorman," said Teal, with a dust-caked ghost of his former grin. "Didn't we agree a long time ago who does the talking in this outfit? You keep well out of range of the screen, and *I'll* call Walker. Do I look as rough as you?"

Gorman surveyed the little man. If he could talk his way out of this he was a genius. "You'll pass for a battle casualty," he said.

"Good!" Teal waved an arm in the direction of the presidential suite. "You'll find a stun gun on the table in there. Put it in your pocket—you'll be needing it." He switched on the communicator. "Now fade and leave this to me." . .

A few moments later the face of Walker appeared on the screen. His expression changed as he noted Teal's condition. "What the devil happened to you?"

Teal cringed, shaking, assuming an attitude of panic. "Captain! You've got to get me out of here. It's the natives . . . I've only just managed to escape. The colonists must have evacuated to get away from them."

"I don't remember reading about any natives on McCann," said Walker suspiciously.

"I found the reports." Teal glanced over his shoulder like a man who expects to be sprung upon by the unknown at any moment. "They didn't appear until the colony was well established. But when they did it must have been a massacre. You've got to land and take me off, it's my only chance. I'm in the government building, you could set down in the square."

" It would serve you right if I left you there," said Walker coldly. " Why should I take a risk on tangling with them ?"

" For the sake of common humanity, Captain." Teal raised his hands, pleading. " You must help me ! I got away from them on the other side of the city, but they're sure to find me soon."

" Don't worry, I'll come," said Walker. " But only because they are so anxious to see you at H.Q." He paused. " Where's Gorman ?"

" I tried to save him," quavered Teal. " But there was nothing I could do."

" Got out to save your own skin, I suppose, you yellow dog," Walker sneered. " Anyway, he wasn't important. Stay where you are, I'll be in the city square within ten minutes."

The image faded.

Gorman stood behind a pillar at the entrance to the government building, holding the stun gun. He squinted his eyes as sunlight flashed on the hull of the I.P. ship which was descending towards the square.

Teal lay in a crumpled heap halfway up the steps below him. "Don't forget, wait until he gets rights up to me," said the little man, moving his head slightly. " He's bound to come over to find out if I'm still alive. When he does, you let him have it. And remember, it's got to be the first shot, you'll get no second chance with Walker."

Gorman hefted the stun gun grimly. " Leave it to me. I'll show him who's important."

The main port of the I.P. ship opened and the lean, black uniformed figure of Walker stepped out. The portable blaster in his right hand described a menacing arc as he peered cautiously round the square. Apparently satisfied that there was no immediate danger he ran across the road at a crouch, looking to right and left as he moved. Gorman's hand was sticky on the butt of the stun gun.

Walker paused for a moment at the foot of the steps and shouted Teal's name. Gorman's grip tightened. It was a horrible thing they were going to do to Walker, but what the hell, he was a cop wasn't he ?

The I.P. man ran swiftly up the steps and bent over the prostrate form of Teal. Gorman stepped out of hiding and pulled the firing lever. He yelled in exultation as Walker's body stiffened and fell, rolling down the steps like a log.

" All right, let's go !" shouted Teal, rising to his feet. At the bottom of the steps he picked the blaster from Walker's lifeless fingers. He stood for a moment, the weapon trained on the unprotected head of the I.P. man. " No," he said at length. " Why make it easy for him?" He headed for the open port of the ship.

Gorman followed him quickly, pausing only for a glance of triumph as he passed the black uniformed body.

Gorman's practised fingers moved over the controls of the I.P. ship as she lifted from the city square and headed for space. "With a ship like this we can really operate," he breathed contentedly.

"What did I tell you?" Teal grinned smugly. He pointed to the forward view-screen with its hailstorm of stars. "Take your pick, Gorman."

"Look at this," said Gorman. "Automatic meteor control—these I.P. ships are really the stuff. And this defence screen, it would hold off . . ."

His right hand was moving towards a switch.

It froze, a rigid thing, no longer under his control. There was a burning ache in the top of his skull.

"*What a pity that other one was different,*" said something inside his head. "*It seemed to have a greater resistance than these two . . . absolutely useless to us.*"

And Gorman could not scream . . . physically.

Dan Morgan.

THE LITERARY LINE-UP

It is always a little difficult to discuss the short stories in an issue when they are over-shadowed by an instalment of a serial, and next month Part III of Lan Wright's "Who Speaks Of Conquest?" makes the shorter material fight hard for recognition. Nevertheless, the short stories are up to the usual high standard of the individual authors—John Brunner presents an ingenious piece of fiction centred round the making of a synthetic man; E. R. James and Francis G. Rayer have collaborated in the writing of "Period Of Quarantine"; and Alan Barclay has "The Refugee" a long story centred mostly on Earth.

By the way, the final story in Barclay's "Jacko" series is now on hand and it won't be long before the mysteries in earlier stories will be cleared up.

Story ratings for No. 44 were:

1. The Solomon Plan - - - - - - J. T. McIntosh
2. There Is A Tide - - - - - Brian W. Aldiss
3. Question Of Cruelty - - - - - James White
4. Thing Friday - - - - - - - John Brunner
5. The Falsifiers - - - - - - Francis G. Rayer

The last three stories were practically tied for third place.

We are always pleased to welcome a new writer to our pages and Mr. Quinn's first published story herewith touches upon an aspect of space we haven't met before. By the way, he is no relation to artist Gerard Quinn.

UNWELCOME STOWAWAY

By P. QUINN

He sat alone in the air-lock, a grotesque, bulky figure in his cumbersome space-suit, listening to the steady throb of the pumps through his external pick-ups as the air was sucked away from around him. He watched the needle on the dial opposite him slowly drop backwards, silently cursing to himself the small meteorite which had caused this unexpected inconvenience. No larger than a man's fist, it had hurtled from the blackness around them, and, evading the deflectors, had skimmed across the roof of the control cabin. Small though it was, its speed had been sufficient to damage the radar antenna and 'blind' the ship, and it was Wesley's lot, as engineer, to go outside and repair the damage.

The *Wiltshire* wasn't a large ship. With her crew of three she ferried her way between Earth and Mars carrying whatever Larson, her skipper could pick up at either end which he thought might be useful at the other. On this trip she was carrying a cargo of fertilizer for the new Martian Deserts Irrigation and Agricultural Experiment, and, until the mishap with the meteorite had been making good time.

The needle on the dial reached 'zero,' and at the same time a light over the outer door shone green. Wesley heaved himself from the seat, staggering beneath the unaccustomed weight of his suit and accessories in the slight gravity of the ship. Clumsily he manipulated the outer-door mechanism and waited while it slowly swung open, revealing the naked beauty of Space in all her glory. Hardened space-traveller though he was, the sight still left him breathless when-

ever he saw it like this, and he thought how insignificant was Man who dared to pit himself against it all. Although the ship was still hurtling blindly through Space, he had a feeling of being suspended stationary in the midst of Infinity.

But there was no time for feeling romantic—he had work to do! Normally, at this stage, he would have contacted the skipper through his suit radio and reported that he was then leaving the air-lock; but as the suit-radios were connected through the main set in the control cabin, and this was out of action due to the radar antenna being smashed, he had no means of communicating with Larson whatsoever. Checking that his safety-line was secure, he closed the outer air-lock door and plunged outwards at an angle to the nose of the ship and drifted to the length of his safety-line, whereupon the slight gravitational pull of the vessel gently tugged him back. He landed feet first on the hull, about a hundred feet from the broken antenna, and fastened his magnetic boots firmly to the plates. Trailing his safety-line, he started walking towards the antenna, each step an effort as he forced his feet upwards against the magnetic pull. His breath came in laboured gasps, and sweat soon coursed freely down his face, unchecked. Around him, all was still—all was silent.

All should have been silent! Above his own laboured breathing he could hear an unmistakable buzzing. For a moment he put it down to his radio, until the realization that the set was dead made him stop in his tracks. Was it possible that his radio was operating after all? What else was there to buzz in his suit? He strained his ears, trying to locate the source of the sound, while his mind whirled, accepting and discarding theories as to what could be causing it. Heating unit? No, that was a scarcely audible hum—he could still hear that! Breathing apparatus? No, that was silent! This buzzing was something alien in his suit—a foreign body—and in no way connected with any of the various accessories with which he was encumbered. Suddenly, it stopped, and at the same instant he became aware that he was holding his breath and his lungs were aching. He exhaled in a sudden gasp, and something touched the back of his neck moving gently through the short hairs there. Involuntarily, he screamed, and dashed his hand automatically upwards to brush away whatever it was, but his helmet prevented him from making contact. Furiously he shook his head and felt the thing depart, and immediately the buzzing started again.

He tried to collect his scattered thoughts and reassemble them. Something was inside his helmet with him. Evidently it was a small insect of some type—he could tell that by its touch—or perhaps it

was a spider ! He thought about spiders for a moment—he had always had a dread of them, even as a small boy. Visions of a huge, hairy, tarantula rose up in his mind before him, running round and round inside his helmet, unable to get out, biting him—the deadly poison circulating through his body. He shook himself; whatever it was that was in here with him, it certainly wasn't a tarantula ! Besides, tarantulas didn't buzz ! It was something smaller, but maybe just as dangerous. Sweat poured from him as he considered his position: here he was, alone in space with an insect of some type trapped inside his space-suit, and the only way to get rid of it was to return to the ship and undress. But supposing the insect was not dangerous—what would Captain Larson and Joe West think of him then ? Surely, the best thing would be to find out, if he could, what sort of insect it was before he went back ?

While he debated what to do, the buzzing ceased, and he suddenly felt something light settle on his nose. He shook his head violently, brushing his hand upwards to remove the irritation, but again his helmet foiled him. The insect departed from his nose, but the irritation remained. Wesley swore fluently, and wrinkled his nose this way and that to get rid of the itch. At least, he thought, ruefully, he had discovered one thing—it was something which flew ! He hoped fervently that it wasn't a wasp or a bee. His nose still itched and he felt a strong desire to sneeze. He sniffed loudly, twisting his nose and holding his breath, waiting for the desire to pass. And as he stood like that the Thing settled on his cheek. He exhaled in a gurgling, choking gasp, the nerves on his cheek tensing against the sudden needle-like plunge of the sting, and he was surprised when nothing happened.

A violent shake of his head dislodged the Thing and it flew away to buzz violently somewhere behind his right ear. He realised that he was sweating freely, but he had learnt something else about his companion. He now knew that it was something which flew but did not sting ! Therefore, it could not be dangerous—unless it could bite ! He thought of what he had heard about tropical insects—leeches, bloodsuckers, vampires. Well, it wasn't a vampire—they were bats, and this Thing was too small to be a bat. But it could be some type of leech or bloodsucker, which, given the opportunity to remain stationary for long enough could . . . And people had had them settle upon them at night and suck the blood from them while they had been asleep. Their touch had been so gentle that they had not felt them, and . . . Perhaps that was what the Thing was doing now, somewhere behind him—sucking his blood ! The buzzing had stopped too !

In horror he tried to turn around inside his suit. He was sure he felt weaker than when he had started out from the air-lock. His life-

blood was probably being sucked from him this very moment. He hunched his shoulders, rolled his head on his neck, and was rewarded with a buzzing by his right ear. Something touched his right cheek, and then settled on his forehead. A violent shake dislodged it. Got to keep the thing on the move—daren't let it settle anywhere !

The nerve-racking game went on for a few minutes. Suddenly, an idea struck him. With clumsy movements he removed his portable torch from its clip on his belt, and, pointing it at his face, shone it through the visor. The sudden light made him blink, but, squinting through his half-closed lashes, he knew that he would be able to see anything which passed between his eyes and the light. By shaking his head to and fro, he kept the Thing moving and prevented it from settling on him, until, at last, it came to rest on the inside of his visor. He could only see the silhouette of it against the strong light, but that was sufficient for him to recognise his travelling companion—it was no more than an ordinary house-fly ! He remembered the trouble they had had back on Earth when the fertilizer had been loaded aboard, and the multitudes of flies which had swarmed about the ship. They had liberally sprayed the interior with D.D.T., but evidently this little fellow had taken refuge in the suit locker and had escaped the slaughter. He grinned to himself—fancy being scared of a little fly !

Still smiling with relief, he switched off his torch, and, replacing it on his belt, commenced his laborious journey to the broken antenna. Now that he knew what it was that was in his helmet with him he could ignore it and carry on with his work. But to ignore it was easier said than done !

He hadn't gone another half-a-dozen paces before the fly, disgruntled at having the light removed, commenced its buzzing again, and then settled on his chin. Wesley cursed it and shook it off, but the itch remained where it had been. He cursed again, being unable to scratch himself, and the very knowledge that he could not do so made the itch even more unbearable. He tried to concentrate on his walking, but the itch was like a burn upon his chin. Sweat trickled down his forehead from his exertions, and the fly came around to sample the salt. Its tiny wings fluttered, and the irritation made Wesley halt again. He swiped upwards with his hand, but the hard quartz visor was a solid wall before him. He tried to bang his forehead against the visor in an attempt to squash the fly, but, like the proverbial donkey and the carrot, the further he moved his head forward, so moved the helmet. He pursed his lips, protruding the bottom one, and blew upwards. The fly departed.

It buzzed around for a while at the back of his head and then decided to explore the jungle of hair on top. The slight, almost imperceptible movement of his displaced hair, was picked up and magnified by his nerves, and Wesley cursed out loud in a manner that would have done credit in any space-port in the Solar System. After repeated shakings, the fly abandoned its exploration and settled on the back of his neck.

Wesley had had enough ! He looked back the way he had come, and could just see the pilot light shining on the side of the air-lock door. He turned round to retrace his steps; to hell with what Larson and West would say ! He was going back to strip off this suit, find the fly, and pull its wings and legs off, one by one, and then stamp it to death with his boot. He would then search the rest of the suit systematically for any more stowaways, and, not until he was absolutely certain that there were no more would he return to fix that antenna. Blast them and their ship ! If either of them so much as made one crack, he swore he'd . . . !

" Get out, you bastard !" he screamed at the fly, which was now crawling around his ear. He balled his fist, and banged away on the outside of the helmet level with his ear. But the fly ignored him and carried on with its investigation. The delicate touch of those gossamer wings on his sensitive skin was pure agony, and then a horrible fear smote Wesley . . . Fear so swift and sudden that sweat poured anew from his forehead again. Suppose it crept right into his ear and up to his brain ? He was no biologist and for all he knew there could be a hollow tube right through from the ear to the brain itself. And if the fly once entered there . . . ! He screamed and cursed at it, his nerves writhing at every movement it made, and then, when it seemed that his whole mind would burst, the fly left his ear and returned to his forehead for another feed of salt. But the irritation where it had been remained burning in his ear !

He felt it moving on his forehead, across his left eyebrow, around the eye-lid, and he suddenly realized that tears of frustration had been coursing down his cheeks. The fly sampled them, and its touch was like a hot needle. He pursed his lips, blew upwards, twisted his face into every imaginable contortion he could think of in an attempt to dislodge it, but the fly must have realized that it was safe, and carried on with its own private business. He stood on the hull of the space-ship, a small comical-looking figure, screaming abuse into his helmet. He stretched out his hands as if in supplication to the heavens around him, and then, grasping his helmet in both hands, wrenched and twisted in an effort to remove it there and then. This failing, he sank down onto his knees, banging his head repeatedly against the hull of

the ship, tears of rage and frustration streaming unashamedly down his cheeks, but the quartz visor was tough.

The fly, annoyed at the rude interruption to its meal, flew off and circled round and round his head, lightly touching him here and there. Wesley knelt there, his head on the hull of the ship, all thoughts of the broken antenna washed from his mind. At each burning touch of those gossamer wings his tortured nerves writhed in torment, and his screams of abuse became gentle sobs as his sanity slowly left him, until, at last, he knelt there, gently rocking backwards and forwards, and drooling softly to himself.

It was a beautiful garden. The trees were multi-coloured and changed form and hue like flickering flames. He walked on moss, so soft that it felt as though he were gliding or floating over it, and the whole world rotated slowly around him. But somewhere, behind him —almost on his shoulder—there was something wrong. Like a big black shadow which cast a weight upon him, throwing the whole serenity surrounding him out of balance. He turned his head, but could see nothing. But it was there ! And as he became more aware of it, the beautiful garden slipped away, and the shadow became larger, and larger, and larger ! He screamed, realization coming to him, and the shadow moved, and noise came into being—a buzzing noise which became louder, and louder, and even louder. It became a roar, and he tried to cover his ears with his hands, but there was a helmet on his head and he couldn't reach his ears The roar became a light—a blinding light—which slashed down through his mind and cut off all consciousness of reality from him, and he drifted through a haze of peaceful semi-consciousness.

He walked towards the ship which stood gleaming in the sunlight. He had to report back to the Skipper that the job was done. What was the job which he'd just done ? He couldn't remember. Still, it didn't matter, anyhow ! The concrete landing base was firm beneath his feet, and reflected the light of the brilliant sun. It was stuffy, too. Be glad to get rid of this space suit when he got inside ! And then they were in space and he was drifting towards the open air-lock door. He had to tell Larson . . . . He couldn't remember what it was that he had to tell him, but he had been searching for him for a long time.

He was inside the airlock. The pumps were humming and he was watching the needle on the dial move towards the ' Full ' position. He reached up to undo the clamps of his helmet at the back. Suddenly, he stopped. The pumps humming ? They should throb—a steady *throb, throb, throb.* What was there that hummed ? He opened his eyes wide in horror as he remembered, and realization came to him,

and something hit his right eyeball with stunning force. He was in space, drifting. No, he was inside the air-lock, about to remove his helmet . . . Some-one was screaming . . . it was him ! He had to see Larson . . . he had to get inside the friendly interior of the ship. Open space all around him . . . the fly inside his helmet . . . the pumps, the dial, the lights . . . He had to get away . . .

Larson and West reckoned it would take Wesley an hour to fix the broken antenna. Every now and then Larson would check the radio to see if it had started working yet. He made up his log, checked his his records. Joe West was busy working out a new route to compensate for the time spent drifting. After an hour had passed and the radio still remained lifeless Larson became anxious.

" I don't get it," he said to West, as he replaced the dead hand-mike. " Stan should surely have been able to fix that antenna by now, and if the job was too big for him to do out there he should have brought it back inside."

" I'll go out and have a looksee," said West. " I'll come back and let you know what's happening, and then go out again and give him a hand." He went to the suit locker and brought out his suit.

Larson helped him to get dressed, gave the clamps on his helmet a final twist, tapped him on the shoulder and gave the ' O.K.' sign. West stepped into the air-lock.

He sat down on the bench, listening to the steady throb of the pumps through his external pick-ups, and watching the needle on the dial. Stan was a conscientious worker, but surely he couldn't have been that oblivious to the passing of time. Something must have happened to him out there—but what could happen ? He sat pondering. A green light shining over the outer-door brought him back to the present. Soon see what's happened, he thought, as he operated the mechanism and watched the door swing slowly open.

The heavens seemed sprinkled with a million stars all around him, and he paused in the open air-lock door to admire the beauty of space. The ship seemed immobile in the midst of it all. But, as he rotated his vision, he stiffened; something drifted a few yards from the hull—something that was connected by a life-line to the clamp near his right hand. West drew in the line and looked down at the frozen features of what had once been Stan Wesley—features which were twisted and contorted with horror (of what ? he wondered, grimly) and frozen immediately in death when confronted with the airless void without the protection of a space helmet. There was nothing to indicate why he had removed his helmet.

P. Quinn.

This month's article by Kenneth Johns is shorter than usual but deals expressly with the changing pattern of aeroplane design in conjunction with increasing speeds and heavier payloads.

THE VERTICAL APPROACH

By Kenneth Johns

Men have long had dreams of flying as simply and as care-free as birds. But airplanes only partially fulfil these dreams. Today we can fly at over 1,100 miles an hour but, for short distances, the difficulties of take-off and landing more than nullify the time-saving advantages of air travel.

The increasing speed of modern aircraft, with their smaller wings and high aspect ratios mean that airports must have longer and longer run-ways. So the number of airports that can accommodate the latest planes becomes proportionately smaller—in spite of the millions of pounds being spent on extending runways.

There is a limit to the size of airports and that limit has now been reached. Alternative methods of take-off and landing must be found. The uncompromising laws of aerodynamics prevent a straight forward answer to the problem. Helicopters, for example, are not the brilliant solution, as was once thought. Helicopters are slow and uneconomical and their design alone involves a fantastic number of problems. So aeronautical designers are trying to combine the helicopter's ability to land on a few square yards of surface with the speed and economical operation of conventional aircraft. The results are the strangest aircraft ever to be designed.

There are three approaches to the problem. One is simply to increase the lift efficiency of the wings. The second is to combine the power of lifting rotors and wing surfaces. The third merely thrusts the aircraft off the ground by sheer brute force of jet engines.

To increase the efficiency of a conventional wing during take-off and landing, the bugbear of the boundary layer must be overcome. In 1918, attempts were first made by slotting the wing along the leading edge, to force the air to cling and not to break away from the surface. Handley-Page achieved some promising results. Later, suction was applied by a fan in the wing. Porous surfaces and perforated metal edges were also tried, the air being sucked through them and then blown out again. Improvement was about 30 - 40 per cent using a separate engine.

It was not until the era of the gas turbine that the great promise shown by this method was fully realised. The gas turbine engine can provide a direct stream of compressed air from the compressor to control the boundary layer of air. B.O.A.C. will be using this system on conventional airliners in the near future.

Encouraging though this is, the problem is still basically unchanged —how to land large aircraft without the costly concrete ribbons of the current airport, which force these airports to be built long distances from the cities they are intended to serve. That it takes longer to reach London Airport from the City than it does to reach Paris is a reflection only on the hard facts of aerodynamics. The proposed overhead, mono-rail links are no solution, only a stop-gap measure. Means must be found of landing aircraft in much smaller spaces.

The combination of lifting rotors and fixed wings offers much. The Bell XV-3 has wings with lifting rotors at each tip. They lift the plane from the ground and then the rotors turn through ninety degrees to give forward movement. Horizontal speed is 175 m.p.h., about 20 m.p.h. more than the helicopter record. Development of this design may prove fruitful, but it will have to attain speeds around 400 m.p.h. before it is commercially economical, implying the use of jet engines.

Another intriguing design is put forward by the National Advisory Committee for Aeronautics. Here the whole wing of the aircraft is swung on a central pivot so that the forward mounted propellors point skyward. They lift the ship up; then the wing gradually assumes its normal position, bringing the airscrews into the horizontal thrust position. A second design has only the rear section of the wing hinged, so that it hangs away from the airstream. A series of vanes like Venetian

blinds then trap and turn the airstream through ninety degrees, giving vertical lift. This permits hovering during take-off and landing.

In the Lockheed Salmon and Convair Pogo neither the wings nor the airscrews are tilted. The whole aircraft is tilted.

These are the famous vertical take-off planes. They are primarily designed for operation from ships, where the long and vulnerable flight decks of carriers give nightmares to Commanding Admirals. Had these planes been in use during World War II, the loss of aircraft catapulted from the bows of merchantmen would have been alleviated. A conventional fixed-wing fighter could not return to the merchantman but had to be crashed alongside and the pilot hauled from the drink.

The vertical take off fighters, as has been proved over a series of tests, can both take-off and land in the vertical position. They both use propellor-turbines. The delicate business of dropping the tail *on* the ground, not *through* it, has been successfully overcome. So far no civil applications have been announced.

The coleopter or flying barrel, designed by Dr. Helmut von Zborowski—a former German aero-engine expert now working for the French Government—is similar to the vertical take-off aircraft, with one important difference. In appearance the coleopter looks like a rocket, with a barrel-shaped sheath around the lower two thirds. (Coleopter comes from the Greek for "sheath-winged"). This sheath is a highly efficient circular wing within which are rotating airscrews. The craft takes off vertically, then tilting for normal flight. When sufficiently high speeds are attained, ram-jets take over. So far, models have been put through wind-tunnel tests. Similar designs using ram-jets have been developed over the past years by Leduc.

Conventional helicopters employ a complicated and expensive rotor-blade mounting and the idea of standing a man on the fan instead of under it was mooted as long ago as 1916 by two Austrians, who actually built such a craft. Today, the idea is being Service-tested in America where the Army purchased twelve de Lackner Aerocycles of this type. Two small contra-rotating helicopter rotors powered by a 44 h.p. outboard motor give a speed of 65 m.p.h. with a 150 mile range. The engine and rotors are above pontoons enabling both land and water operations. The Aerocycle, also known as the Heli-Vector in a smaller edition, can lift 300 lbs. The passenger stands upright above the blades and controls are placed on a motor bicycle-type handlebars.

A similar but neater-looking machine is the Hiller Flying Carpet. The name is richly deserved. Here the great difference is that the helicopter blades are not open to the air all round, but are encased

by a protective wing. The system has been given the name ' ducted fan ' and, in the Hiller design, employs two internal combustion motors driving the contra-rotating screws. The ring surrounding them is also of use as a circular aerofoil. Mounted above the screws, a wooden platform supports the passenger, who stands inside a circular cage. By pressing on this cage he can steer the machine. The instinctive body-control thus achieved is far superior to normal aeroplane controls.

Charles H. Zimmerman, in conjunction with the U.S. Navy Office of Research designed this machine and, already, the Navy envision many vital tasks for which it will be ideal.

The ducted fan principle—like an electric fan in a shallow cylinder —can be adapted to larger machines and it will be possible to lift heavy weights directly upwards with four fans combining their lift. The aircraft is, in fact, riding a column of air. It is logically inevitable that the personal Flying Carpet will one day be sold by local car dealers. The era of individual aeroplanes—which never happened because of expense and complexity—will happen when these small machines are mass produced as cheaply as motor cycles, at about £200.

But perhaps the most spectacular of all these revolutionary attempts to attain practical vertical take-off is thc Rolls Royce ' Flying Bedstead,' designed by Dr. Griffith.

Using jet turbine power alone, it can rise and hover, control being achieved by four compressed air nozzles.

A similar American version has small wings and the jet engines can turn ninety degrees to provide forward thrust. Other methods now being developed to overcome the difficulties of rising into and descending from the air include the trapped vortex, variable swept-back wings and the use of the whole wing as a gas turbine. Here the leading edge is used as the air intake duct. One application of this is in helicopter rotors where each rotor arm consists of a small ram jet.

A Gloster Meteor has flown experimentally with a deflector in the jet stream to assist take-off and reduce stalling speed.

Whilst the rocket may reign unchallenged as Queen of Space, it is of little use to the man who wishes to ride his own personal flying machine to the office—and arrive at nine o'clock with six million others. By the visionary use of ducted fans and the application of compressed air lift, we could all be in possession of our own personal levitators. Traffic planners will have a whole new dimension to work in.

These ultra-new developments in the field of aeronautics, now solid scientific facts, can give pleasure to the connoisseur of science fiction. They were all predicted years ago.

Kenneth Johns.

SOLD

This is a story about a 'doohickey' — a gadget used to influence the minds of potential customers into buying something they do not want. It could make its owner a millionaire —it could also give him other dreams.

By Richard Rowland

Illustrated by HUTCHINGS

They hadn't left me much room but I put the helivan down with an inch or two to spare on either side and went to see old Warnum, the fairground boss.

Space grafters are never exactly popular with the rest of the travelling fraternity and, from the look on Warnum's face, I was no exception. "Thought we'd seen the last of you," he greeted me. "Wotcha flogging this time? Them two-headed snakes from Cent III or that fancy parfoom from Venus?"

I handed over my ground stake together with a few extra sonars and the old blighter cheered up a bit. "Nothing like that," I told him. "I've got a brand new line. Art from the deeps of space! Masterpieces of other worlds! Full size reproductions in full colour! Here, I brought one for you."

He took the picture and looked at it, holding it at arm's length and then close to his nose. "What's she doing up a tree?" he asked.

"*She* isn't up a tree," I explained. "*He* is climbing one. You've got it upside down."

"Don't wear much, do they?" said Warnum.

"It's from Findyl," I went on. "'Man picking fruit.' See those purple blobs about as big as a violin? They're oiglstrep berries. Boy! Do they make a drink from them!"

I watched the expression alter on his fat face as I told him the picture was a valuable one. Token of esteem, regard and so on. "Thanks, Clack! Real good of you." He propped it up on top of the dresser, still upside down. "Lovely figure," he said.

I made my way back to the van. It was too early yet for many people to be on the fairground. Another half hour or so and the place would be packed. I began to stack my pictures so as they'd show to best advantage.

It was true enough, as I'd told Warnum, that the pictures had come from all over space; not only from Venus, Mars, and Jupiter but from deep space. Places like Centauri III, Findyl, Marnus and so on. The originals, that is. What I was selling were reproductions—rather special reproductions.

It was an unusual line for me but I knew I could sell them. For one thing the price was ridiculously low, just enough to cover expenses. Fifty sonnets, one half of a sonar, each. The frames alone were worth

double. But it wasn't the frames and it wasn't the pictures I wanted to sell. There was a certain little doohickey I'd picked up on Findyl . . .

When the crowds came I had more than my fair share, and trade kept up all through the three-day stand.

I could have rented a stall in any of the superstores in any big city and maybe done twice as well again, but then the buyers of my pictures would have come from a scattered area. Not so easy to trace. By sticking to fairgrounds and town markets, I could more or less guarantee that the pictures went into local homes: which was where I wanted them to be.

By the end of the three days I had sold 734 pictures to the citizens of Crawley and neighbourhood and I could get started on the real work. Selling something quite different, from door to door.

First thing I had to do, though, was to get something to sell. It had to be a pricey job that carried a decent commission, and something most people hadn't got. Whether they wanted it or not didn't matter much.

After a search through several papers I found just the thing. Salesmen were wanted for the latest type robot. A robot to end all robots; did everything from feeding the baby to making the fourteenth at a party given by a superstitious hostess. It retailed at 250 sonars. That's for me, I thought, and I flew to the city to see the boys who made it. When I'd satisfied myself that they'd got a big enough production line I took the job. Commission was a measly 10 per cent, but I figured that when I'd shown them what I could do I'd be able to talk terms.

I loaded a score of specimens into the helivan and took-off for Crawley. Those robots were certainly something. Within five minutes one of them was flying the van and talking back to Control like a blood brother. I decided to keep it, wrote Evelyn Clack on its name tab and slipped the tab into its guts as they'd shown me at the works. It was now forever Evelyn. I chose 'Evelyn' because I didn't know whether it wanted to be male or female, and I didn't want a frustrated robot on my hands.

Over Crawley, I told Evelyn to climb the van to park level and hitch to a hold beam. I went to my private room and switched on that certain little doohickey from Findyl. I'd already set it. Then I turned in and slept the sleep of the about to be successful. When I woke, Evelyn had prepared the breakfast.

Crawley looked quiet and peaceful from height. It hadn't been allowed to burst like a boil and spew a puss of houses all over the green country. From my point of view it was ideal. Neat, compact and

easy to work over. I reckoned on being in the neighbourhood for close on a month. I didn't need that long.

When I checked with the planscreen, I found that the concentration was even better than I had hoped. Two main areas, the larger of them close to where the fairground had been. I had Evelyn unhitch and we dove down.

I had no clear idea of how accurately I could pinpoint those I was looking for but I soon found out it was easy enough. When I had adjusted the planscreen to close range, the doohickey—the Findyl name for it is rude in any other language—picked out each target to within something like six inches plus or minus a millimetre.

I left Evelyn in charge of the helivan while I made my first assay. Another robot, un-named, walked beside me. I'll admit to a feeling of excitement as I strode up the path to my first front door. I stood on the buzzmat and raised my hat to the viewer. The door opened. A neat little woman with the fashionable raspberry-coloured hair smiled back at me and stood aside as though she were expecting me: which, of course and in a way, she was. The robot followed me through the door.

I saw the picture on the wall as soon as I went in. It was a reproduction of one of those I'd brought back from Mars. A three-dimensional landscape, keyed to Martian time, which responded to day, night and the in-between hours. Just then it was twilight so I couldn't see much. But I remembered it showed a stretch of that reddish sand, a broad channel and a clump of those stunted, mauvish, Martian bushes. Not one of my favourites.

I came out of the house inside twenty minutes and I came without the robot. Its name was now Susan and I'd left it holding down the neat little woman with one hand while it prepared a blue dye with the other. It seemed it didn't like raspberry. I was glad I had got cash.

The nearest indication now came from the house next door but one. It was a solidly built place so that the occupants were not likely to hear the faint screams from the neat little woman.

A man answered the doorbuzz this time. He was large, with overhanging black eyebrows that looked as though they'd been knitted on, and a pair of angry eyes.

The Findyl folks maintain that their doohickey works with everything from a virus up but I wasn't too sure. However, at the word 'robot' the large man's face lit up so much I thought his eyebrows would catch fire. "Step in, gentlemen," he said. "Please!"

I stepped and so did the robot which Evelyn had thoughtfully unpacked while I was selling the first. "This is no gentleman," I told

my customer, giving him a slight twist on the old gag. "This is a robot."

He was amazed.

In ten minutes the sale was over. "By the way," I said as I was leaving. "You've hung that picture upside down. It's really a man climbing a tree." I told him about the oiglstrep berries and the singularly potent potion made from them by the Findyl natives.

He was impressed: said he hoped one day he might sample some oiglstrep juice but that he liked the picture the way it was. He was a bit brusque and I could see he was eager to get in some practice with his robot. I went down the garden path fast, hoping that Sydney hadn't any aesthetic objections to black, overhanging eyebrows one purl one plain.

I put in eight solid hours that first day and sold nineteen robots in nineteen calls. I considered taking Evelyn out and selling him, or her, but, as it had a name it was, strictly speaking, second-hand. Besides I had become quite attached to it.

We had a meal together in a local chop house—which reminds me that I've never succeeded in finding out what robots do with the food they poke so elegantly into their mouths—and then returned to the helivan. Back at park level, I put in a rush call for more robots to be sent down overnight and went to bed. I kept the doohickey working to be on the safe side.

Breakfast was ready again when I woke up, with the tele-tear-sheet neatly propped against the Marslade. I was glad to read that blue hair looked like becoming all the rage. I wondered whether Evelyn could tell me the winner of the next day's big race.

As it happened I was so busy during the day that I clean forgot to ask him. When I totted up the figures that evening, I found I had made 22 calls and unloaded 22 robots. Not all were cash down of course, but an order is an order even though the last payment may be made only in time for the robot to measure its late owner for the long box.

By the end of the third day in the area, sales stood at 64 for the same number of calls. Evelyn made a bright suggestion that evening. "Mr. Clack," he said, and, forgetting for the moment the automatic expression-stat built in to this model, I marvelled at the affectionate regard in his eyes. "Mr. Clack, how would it be if I gave you a hand? I've noticed that the job on which Mr. Clack is engaged is a wearying one." His expression clicked over to one of mild reproach. "Mr. Clack allowed his Cracklerust to soften in the bowl this morning—all because Mr. Clack was tired and overslept."

This was an angle that hadn't occurred to me. "Why, Evelyn, I said. "That's quite an idea. Do you think you could do it?"

Evelyn almost achieved a snigger. "With due regard to Mr. Clack's abilities, the work would appear to be relatively simple."

"The operative word is 'appear,' Evelyn," I said sternly. "A whole lot of work has to be done before I can guarantee a single sale. Believe me, boy, there's more to this than meets the eye."

Evelyn's eyelids quivered apologetically and for a moment I wondered whether they'd included a tear-tank in his make-up. "Even so," I told him. "It's a good idea. I'll sleep on it."

I dreamed of a stooge team of robots flooding the country with anything I cared to give them to sell. And another team of robots to count my commission.

In the morning I had a heart to heart talk with Evelyn. I was busting to tell somebody anyway and what could be safer than a robot? I tone-keyed his secret circuit. The expression-stat turned on a gaze of unblinking reassurance. Believe me, no confidential secretary ever looked more confidential.

"Evelyn," I said. "I'm going to take you into my confidence. There are aspects of this particular selling campaign which, according to some standards, might be called unethical."

Evelyn's expression said quite plainly that such a thing was impossible, or it might have been that he wouldn't put it passed me. I wasn't sure.

I led him over to the doohickey. "This came from the planet Findyl which whips round a hot little sun a long way past the Centauries. It's what is called a hypnotic compulsion unit."

"Dead crafty!" murmured Evelyn.

"Yes," I said, "and then some. The trouble is that it doesn't work direct. The actual compulsion has got to come from a secondary doohickey in close proximity to the victim—I mean the subject. The suggestion is taped into this unit which then, when switched on, activates all the secondary doohickeys within range."

Evelyn passed an impeccably manicured hand over his smooth brown thatch and slid his eyes sideways. "Mr. Clack's problem is to ensure a suitable prior distribution of the secondary doohickeys over the area to be exploited?"

I glanced out of the port at the clouds scudding swiftly by below the helivan. I always think it's bad psychology to let these robots think they're cleverer than you are. I got what he meant second time round. "Good boy!" I said. "You've tagged it neatly. But it's not a problem any more. I solved it some time back."

Then I told him about the pictures. How I planned to tour the country selling them. How I had already sold 734 of them. "In case you haven't guessed," I added. "The secondary doohickey is built into the picture frame."

In the following fourteen days Evelyn and I between us sold 723 robots. I couldn't account for the missing eleven. Most likely, I surmised, those who had bought them had sent them to friends in other parts of the country. I hoped they'd wait until I got to them before buying robots.

When I got back to the factory they told me they were cleaned out: there wasn't a robot in the place. I collected my 18,000 sonars odd of commission—no chicken feed that—and took off for the bright lights.

Before cutting loose I remembered there were a couple of things I had to attend to. First, I bought the firm which made the reproductions of the pictures and turned the output full on. Second, I took a controlling interest in the electrical outfit that thought it was building some sort of radio into the frames. Then I checked my collection of phone numbers.

In between times I did some serious thinking. I wasn't greedy. All I wanted was to make a quick million sonars and retire to glorious idleness. I realised I didn't have to sell robots all the time. I could sell anything. Anything, that is, that had a reasonable turnover and a respectable rate of commission. It never occurred to me then that I could make more lolly in other ways. That was the trouble with being born a salesman. Once a grafter, they say, always a grafter.

In the end I decided to stick to robots for a while, if the little matter of a raise in commission could be arranged.

It was, and with no trouble at all. Red carpet all the way from the moment I touched down in the yard. "Yes, Mr, Clack. Certainly, Mr. Clack. Anything you say, Mr. Clack." They gave me a 5 per cent raise on the commission rate: made me sales manager: begged me to accept a seat on the Board: and started building a new factory.

I picked up Evelyn, whom I'd left behind for an overhaul, and took off to collect a load of pictures. Then I headed towards Leicester where I'd booked in for a two-day stand.

On the way I ran over the spiel with Evelyn. He couldn't get the hang of it at first and I began to suspect that he had a built-in snob complex like the old-time servants with their above and below stairs routine.

"This isn't a job to be ashamed of, Evelyn," I said. "You're not selling filthy Venusian postcards, you're flogging reproductions of

cosmic masterpieces." That was, perhaps, putting it a bit high but it impressed Evelyn. His next effort sounded as though he were presenting the prizes at a church whist drive.

I gave it up after that. When he heard me really go to work, I thought, he would probably cotton on.

I put the van down in a fair-sized field, right on the mark, and went to pay my respects to the ground boss and to make the usual complaints about the position he had allotted me. Not that it was that bad but you're not a proper grafter if you don't put in a moan about the pitch. I left Evelyn to lay out the show.

He made an artistic job of it, except for one rather curious mistake. He'd hung all the samples of the Findyl opus 'man picking fruit' upside down. I explained to him the story behind the picture and mentioned, in passing, the brew made from the berries of the oiglstrep tree which the man in the picture was picking. "One berry to a bottle," I told him. "And it has a flavour and a potency like nothing I've ever drunk before or since."

He was fascinated. "I thought it was a woman up a tree," he said.

By the evening of the first day we had sold just over 400 pictures. It had been hot and humid and I wanted a bath and an early night. I was hungry, too, and after I had closed up the display I went in to see what Evelyn had prepared for supper. I couldn't find a sign of him anywhere.

I was puzzled. It's not like a robot to go off on its own. Feeling rather disgruntled, I set to frying myself a couple of eggs, some of those imported Martian tubers that look like butterfly nets and a side dish of Saturn fritters. I'm not a good cook at the best of times and I was just dishing up an unappetising mess when Evelyn walked in.

He was wearing a hat which he'd got from somewhere and he looked confused, almost glassy-eyed. "Mr. Clack, sir," he said, "I am most distressed."

"Not more than I am," I said. "Where have you been and where did you get that hat?"

He drew himself up, or got as near to that as a robot can. "Answering Mr. Clack's first question I don't properly know, Mr. Clack, sir. As to the second, a gentleman informed me that I had won it." He removed the article and looked at it. "I rather care for it, sir. I've never had a hat."

"That's not good enough, Evelyn," I said. "Tell me just what you were doing!"

His eyelids popped up and down slowly. "I was looking for Mr. Clack, of course."

It sounded screwy to me but when I tone-keyed the Tellall control, the details checked. For some reason he thought I had called him from a distance and had set out to search for me. He'd been persuaded into playing at a stall and had been presented with the hat. He hadn't understood what he had done to win it.

I told him to forget the whole thing and he proceeded to make amends by throwing my cooking efforts into the disposer and coming up with a magnificent five-course meal.

We got rid of the remaining 500 pictures the next day and loaded up the same evening with some of the robots I'd had stored locally. I wanted to speed things up so I switched on the doohickey that same night and parked over the town. The routine selling of the odd 900 robots took us just eighteen days.

When I got back, they told me I'd been elected chairman of the company. I thanked them and sat looking at the cheque for my 35,000 sonars commission. It was a fairish sum but at this rate it was going to take me quite a time to reach my target. Then I remembered my dream. Teams of robots selling robots. Teams of robots selling pictures. Properly briefed they could do the whole thing. In a private talk with myself I decided to raise my original target. I'd sell a million robots and then quit. I'd be forty times a sonar millionaire, and approximately was good enough for me. I picked up the phone. "This is the chairman," I said. "Board meeting in five minutes."

The directors came running. I told them that what I'd done so far was only a sample. Now we were going to start. We needed to extend our existing factories and build three or four more twice as big. "Would that be enough, Mr. Clack?" they said, and I thought for a moment they were coming the light sarcastic, but they weren't.

Within a month the new factories had grown like steel-and-plastic mushrooms and the machines in them were turning out robots even faster. Fortunately, or so I thought then, I had sunk every sonar I possessed into boosting the picture and frame output, so I was able to sweep into the campaign firing on all cylinders.

I decided to do the thing in two stages instead of overlapping. All robots on selling pictures, then all on selling robots. First I let loose on fairgrounds and markets all over the country teams of well-trained robot grafters. The sales of pictures swung up rapidly: 300,000. 700,000. 800,000. The thing was a pushover.

It was around this time that I started to have dreams, or rather a dream, for it was always the same. It was about the mouth-watering, indescribably delicious juice so cunningly extracted by the Findyl folk from the violin-shaped berries that grow on their oiglstrep trees. The dream haunted me. I would wake and stretch out my hand for the

glass that, in sleep, had been close by; filled to the brim with the gleaming, colour-changing liquid besides which nectar was an inferior brand of pond scum.

Evelyn didn't help matters. He began, with increasing persistence, to ask me about oiglstrep juice. It's hard to describe a flavour but I must have succeeded because, after a while, he began to talk as though he had tasted it himself—and wanted more. It was then I found out that he had been dreaming too. My dream. As the craving grew, we began to discuss the stuff during the day as well as dream about it at night.

At last the target was reached. One million pictures had been sold. I couldn't raise much interest.

When I reported to pick up stocks, I found the directors distinctly worried. They'd had to put up two giant buildings in which to store the mounting army of robots, and they were considering slowing production. I told them to go ahead full blast and spent the day working out a plan of campaign. At least, that was what I meant to do, but visions of oiglstrep juice, glorious beakersful of it, kept busting my concentration until I was gasping for the stuff.

I took off with Evelyn and a full load of robots and headed for the first town on the list. The new helivan was bigger, faster and better equipped than my old jalopy. Which meant I could switch to automatic. Which meant that I could talk to Evelyn about oiglstrep juice without bothering about the course.

"Are you quite certain, Mr. Clack," Evelyn said pleadingly, "that you can't buy it anywhere on earth?" He was licking his lips and his eyes were almost the colour of the stuff.

"Only on Findyl," I told him sadly.

He gazed out the port, staring upwards as though hoping to see that distant planet. "Do you think, Mr. Clack, we could go there sometime?"

What happened then seemed, at that particular moment, to be the very essence of sweet reason. I leaned forward, dialled Spaceport London on the auto-control, and the helivan swung on to its new course.

Luck was with us. There were two berths available on a ship leaving for Findyl that same afternoon. Also in our favour was the fact that the robot who sold us the tickets had been made in one of my factories. Evelyn, who recognised him, persuaded him to take a cheque.

It's two years now since the ship lifted so we must be about halfway. Several things that had me puzzled previously have become clear. Such as why, in the first place, the Findyl folk allowed me to take away

one of their doohickeys' Such as how, in the second place, Evelyn and I were shanghaied on to this ship, for that's what it amounted to.

I made the first discovery on the second day out from Earth. We were down in the lunchroom when Evelyn, looking as though he'd come into a fortune, announced that oiglstrep juice was on the menu. I called a steward at once and ordered a bottle. " How come you've got this stuff on board ?" I asked him.

I saw by the gleam in his eyes that he was an addict. " Smashing stuff !" he said, smacking his lips. " New, too. First time we've stocked it. All our ships carry it now." He leaned closer. " Matter of fact, it's the main cargo on the inward trip. They're simply pumping the stuff in from Findyl, big export campaign." He smacked his lips again. " The holds were bulging with the beautiful juice when we docked a month ago."

A vague suspicion stirred in my brain then and almost tumbled into certainty. It finally clicked a week later when I stood on Evelyn's hat and made the second discovery.

I picked the hat up and was about to apologise for wrecking it when something caught my eye. I pulled it apart. Concealed in the material was the neatest installation of a secondary doohickey I've ever seen.

There are some things a man can forget and some he can't. I don't bear any grudges now about the fact that right there in Spaceport London, only a few yards from where I bought two single tickets to Findyl, there was literally tons of oiglstrep juice. It was nice timing by the Findyl folk.

I've become accustomed too, to the nightmares—less frequent now thanks—about all those factories turning out all those robots.

What really makes me mad is the thought of those million-plus, ready-made customers for Findyl exports—all lined up by my own hard work.

Richard Rowland.

Faced with an ultimatum from the Rihnan Galactic Federation that the planetary forces of the Solar System join the Federation as vassal allies—or else—the Terran High Command decide to make a fight of it. Commander Brady makes the first move for Terra by visiting Meran, the capital of the Centauran system and demonding the surrender of that sector of space to the Terran forces.

WHO SPEAKS OF CONQUEST?

By Lan Wright

Illustrated by QUINN

Part Two of Four Parts

FOREWORD

By AD 2200 interplanetary travel within the Solar System had been achieved, Venus, Mars and Earth being the Three-Planet governing body for expansion and colonisation with central control vested in Hugo Bannerman, President of the World Senate on Earth. Development of an interstellar drive enables the first Terran expedition to journey to the region of Sirius, led by Commander Stephen Brady of the United Terran Space Fleet. The expedition returns safely to Earth to inform the President that not only is there intelligent life in the Sirian region but that the Galaxy abounds in such life forms—and up to the time of the Terran expedition the inhabitants of the Solar System had been considered very low in the evolutionary scale.

Brady explains to the President that the Centaurans whom they contacted were but vassals of a more advanced race named the Rihnans who dominated all the known Galaxy, keeping a balance of power by the strength of their weapons ; while the Rihnans freely gave their inventions to lesser races under their domination none of these latter had ever been able to solve the mysteries of the Rihnan science.

Bannerman assumes that the Rihnans will expect the Terran race to join the Galactic Federation now that they have achieved space travel—rather than place themselves in perpetual bondage he decides that they will at least make a fight for it and sets a plan in motion to capture a Rihnan ship. When the Rihnan ambassador approaches the Solar System one of his escorting vessels apparently blows up but is in fact cleverly captured and hidden under the frozen wastes of Siberia where the leading scientists of the Three Planets get to work on its secrets under the guidance of Professor Hartmann.

Brady is attached to the President as his personal aide and is eventually sent to the Siberian Base to check an over-enthusiastic report from Professor Hartmann that his scientists would shortly solve the Rihnan secrets. Flown to Siberia, Brady is met by Ben Wilson, Hartmann's chief assistant, who explains that the Rihnan technology is totally different to Terran, but before Brady leaves the Base the scientists have solved most of the problems including the secret of the Rihnan armaments and force-screens. The President considers that they have about three years in which to build a battle fleet capable of resisting the initial assault by the Rihnan satellite worlds.

Three years later the Terran battle fleet is as complete as it can be in the time, armed with weapons of improved Rihnan types. Under the command of Grand Admiral Richmond they disperse to three sectors of space covering the inner Solar planets and wait out the Rihnan ultimatum to surrender. Using the Centauran battle fleet the Rihnans sweep arrogantly into the Solar System expecting to teach the Terran upstarts a sharp lesson, but within twenty minutes their fleet is completely decimated, the few ships which escape the holocaust quickly surrendering either to the Martian-base or the Moon-base. It was the first and last great space battle within the Solar System and gave complete victory to the Terrans.

At Lake Success, President Bannermann is kept informed of the battle's short progress by Brady as the information streams in. As victory becomes assured Brady expresses jubilation but the President is more concerned as to whether the Terrans are strong enough to take on the responsibilities of conquering the Galaxy—for, with the defeat of the Centaurans, they will now have to directly face the might of the Rihnans. Moon Buse notifies him of the surrender of the Centauran flagship and he orders it brought to Earth.

GERARD
QUINN

VI.

Meron, capital city of the Centauran system, was situated on the fourth planet of the star Ortan or Alpha Centauri. It was a giant city even by Terran standards, covering some two hundred square miles of territory within its circumference.

The giant space port which was also the military centre of the Centauran system, was placed some twenty miles from Meron, and was connected with the city by a great underground tunnel which carried nothing but official traffic. The Centaurans were extremely proud of the impressive, regular mass of buildings which was the centre of officialdom within the system, and the great spaceport was no less a thing of pride to them, for it could accommodate, without discomfort, the entire Centauran fleet of over three thousand craft.

It was from Meron spaceport that the Centauran fleet was despatched against the Solar system, and having sent it on its mission of destruction, and basked in the impressive sight of its glittering departure, they forgot all about it. Slight mention was made in official circles that the fleet would be returning in a few weeks, but the manner of its return caused no speculation whatsoever, for it was inconceivable to even the most morbidly minded Centauran that it would return other than victorious, or other than in the condition in which it left.

One day a solitary ship limped slowly towards the space port, heading in from outer space in a long low curve that brought it with mathematical precision to the main landing ramp on the field. At first, as it approached, not much notice was taken of its erratic behaviour. The few ground staff who saw it took it to be an interplanetary passenger ship with mechanical trouble. On its first circuit of the field someone noticed that it was, to say the least of it, in a very unhappy state. Its after guide-wings were completely gone, accounting for its erratic course, its nose was partially blasted off giving it a blunt, ungainly snout, and there were three large holes in the main hull which appeared to have been caused by heavy explosions. Such details, once spotted, aroused more than apathetic interest in the field control room, and while such detail could be readily seen without optical aids, the identity of the vessel was still not clear, until a pair of glasses was trained on it.

Inside seconds utter confusion and panic swept through the spaceport buildings, for through the glasses, plainly and for all to see the name of the vessel stood out like a beacon. It was the *Lyra Comet*, and the *Lyra Comet* was the flagship of the fleet which had been sent against the Solar system. The fact that the flagship had returned sent confused officers hurriedly sweeping the skies for signs of the return of the rest of the fleet, and panic mounted as the detectors swept

deeper and deeper into space and found—nothing. The *Lyra Comet* was the only vessel within a million miles of the planet.

It took the local Commander less time than it takes to relate to reach the field by the underground approach from the city, and he arrived just in time to see the ship brought safely if somewhat bumpily to the ground.

The landing ramp was shifted hurriedly alongside the entry port, and a ground party waited anxiously for the crew to disembark. As they and the group in the control room watched, with mounting apprehension, the entry port swung slowly open until a space about three feet wide was showing, there it stopped, and through the gap was thrown by an unseen hand a round metal container. It bumped and jolted down the ramp and rattled metallically on the ground in front of a bewildered and uneasy group of officials. The door slammed shut again.

The group at the foot of the ramp eyed the container with some perturbation, for to the Centauran mind anything out of the ordinary was something to be avoided. Their curiosity did not extend to the unknown and the possibly dangerous, and each of them waited apprehensively for one of the others to do something. It was an irate Commander who ordered them, through the loudspeaker, to bring the contents of the container to him at once, and it was a cautious Commander who ordered them to see what was inside before they came any nearer to the main control room.

One of the group reached unwillingly for the container and pulled reluctantly at the already loosened lid which came off suddenly and without any trouble at all. Inside was a single sheet of some organic substance heavily engraved with Centauran lettering. It was addressed to the *Government And People of the Centauran System*, and upon reading that, the bearer did not bother to go any further, he made hastily for the control tower to deliver the document to his superior.

The Commander snatched it from him as soon as he entered the room and began to read, and as he read he gave every indication of mounting incredulity, horror, and finally, overpowering rage. His outward display of emotion was such that his subordinates took pains to get as near the exit as they could without being too conspicuous. Having read it through once he read it through again, out loud, and in a voice which threatened to wreck the more delicate fittings in the control room with its reverberations.

"Listen to this," he thundered, "'This ship, which we believe to be the flagship of the fleet sent against the Solar System, is the only surviving member of that fleet. It is now manned by officers and men of the United Terran Space Fleets.

'We have come on a peaceful mission and have no desire to start hostilities unless such action is forced upon us. We come as the official representatives of the Solar Empire, to ask for the surrender of the Centauran armed forces, and to extract a recognition by the Centauran government that the total defeat of their forces by those of the Solar Empire has been effected. In extracting this recognition we desire to make it clear that all conquered territories which have taken warlike action against us, shall, henceforth, be included as subservient portions of the Solar Empire, and shall pay tribute and conduct themselves in accordance with their new position.

'If, in due course, these territories show themselves to be amenable and loyal to the wishes and ambitions of the Solar Empire then they will be raised to the status of self-governing States within the compass of the Empire. We wish to send delegates to your government to accept formal surrender, and we desire that some sign be given us as a guarantee that safe escort shall be given to these, the accredited ambassadors of the Solar Empire.'"

As the Commander ended, complete, deathly and astounded silence cloaked the room. The other occupants gaped wordlessly at him and at each other, for there were no words in their, or any other, vocabulary to express their feelings at that moment.

The arrival of the ship in its battered condition had been the first shock; the knowledge—which they had to admit on the evidence submitted—that their main fleet had been destroyed was the second shock, but the third blow, the knowledge that they were the ones who were being asked to surrender, was too much. The mind reeled under the impact of the combined facts, and as each fact was hammered home, others came to light. More than one asked himself what had happened to the invincible Rihnan weapons? There was no end to the possible extent of the disaster to which they had succumbed, for not only their world but their system and their entire Universe was crumbling chaotically about their heads under the impact of that single, irrefutable sheet of paper.

The first sound to break the silence was the voice of the Commander as faint and unnatural gobblings issued from him. His first coherent words were, "Blast that ship off the field." After which he elaborated and went on, "Turn the atomisers on them and clear them off the field. Jump to it, don't just stand there. Do something."

He rose from his seat, and the movement galvanised his assistant into action. He rushed to the communicator and shouted in a voice which hovered on the verge of panic, "Atomiser batteries two and three—blast that ship off the field. Yes, Commander's orders."

All the occupants in the control room then turned their attention to the ship, and what they saw gave them another, if lesser shock. While their attention had been taken up by the message which the Commander had read the ship had taken on a bright golden glow which enveloped its entire hull in an aura of shimmering light. It did not distort or hide in any way, if anything it sharpened the outlines of the craft and gave it an unnatural clarity in the atmospheric haze. They had only seconds to observe and note the phenomenon before the preliminary blue flash of the atomisers lit the field, and a fraction of second later the blue ray of their beams covered the intervening space to the ship—and the two batteries blew up with a shattering detonation that rocked every building for miles around and broke every window in the control room.

The Commander was the first to pick himself up shakily from the floor, three others lay groaning, two gashed by flying splinters from the window, and the third stunned by hitting a piece of furniture as he fell.

The Commander recovered his senses with remarkable rapidity, and he seized upon the only sane explanation which his reeling mind could possibly consider.

He mumbled, "Fools probably forgot to put up their defences, those fiends have turned our own weapons on us. Get one and four on the job."

The assistant shouted the order into the communicator in a voice that was shaky and uncertain, and all of them watched, dazed and unbelieving, as one and four went the way of two and three.

The Commander himself ordered the Diffusion Ray into action, and felt his already shattered senses reel sickeningly as it went the same way as the Atomisers. The space port by that time was almost completely wrecked and the panic was already stretching to the city as the unexplained detonations continued at irregular intervals. The only seemingly unconcerned thing for thirty miles was the unmoved and strangely glowing ship on the landing ramp.

Inside the ship Captain Brady and his crew of eight hundred watched with grim amusement at the scene outside as the Firebeam followed the Diffusion Ray, and the Neutronic Disintegrator followed the Firebeam.

"Though why we have to go to all this trouble I can't for the life of me make out," remarked Commander Murphy, his second in command.

"Psychology," replied Brady with dark understanding. "Keep them ignorant and keep them guessing. It's all been worked out by better brains than yours, Murphy."

" I still don't get it."

" Bannerman saw the difficulties before anyone else," Brady told him. " Once we had defeated them how were we going to take over the Centauran system without tipping off the Rihnans ? He realised that we couldn't just send in four or five hundred battle cruisers, they would have been spotted before they got within ten light years, so we send in one ship, make it one of their own ships and they won't even notice it. And that is about what happened."

" I still think it would have been better to blast in as soon as possible with every available ship and grab the system before they could do anything about it," insisted Murphy.

Brady laughed. " Bull at a gate attitude. First of all, they don't know what happened to their fleet, second they can't imagine how we got hold of their flagship, third they never had anything go wrong with their weapons before, and fourth and most important they have never in their whole existence been faced with a stiuation like this. They're like mice that are suddenly confronted with a dozen horribly efficient mousetraps in a world where they usually have to worry about one inefficient one. The one trap they think a way round, a dozen they go round in circles."

Murphy sighed, " If you say so."

" I don't. The psychologists thought that one up."

By now all was quiet outside, and Brady surmised, quite rightly, that the local commander had used up all his resources and was shrieking blue murder for assistance.

" Presently," remarked Brady prophetically, " They'll bring up their spare cruisers to do the job for them, and after they have been disposed of we'll go out and meet them with suits on."

It took rather longer than Brady suggested, mainly because the Commander was too badly shaken to give a coherent account of what had taken place at the field, and it was only the explosions together with evidence of considerable damage that could be seen over the televiewer that persuaded the Centauran government to send a reconnaissance vessel over the field. After the report from that vessel they hurriedly got together all available war vessels on the planet and organised an expedition to make up for the shortcomings of the local defences.

The Grand-Council of the Centauran Government watched with ever growing horror and dismay as ship after ship dived to the attack —and vanished in a thunderous explosion and a brilliant display of fireworks. Their states of mind duplicated exactly those of the local Commander and his staff earlier on, they were up against something

quite outside their experience, and they had nothing with which to combat it. They could only watch numbly, blindly almost, as fourteen separate attacks were made on the weirdly glowing Earth-manned ship, and fourteen ships were blasted inexplicably to their doom.

The survivors gave up and returned to base, while a panic-stricken council went into a huddle to try and find what had gone wrong. Of course they never did. Even the Commander of the attacking fleet had no ideas on the subject, and he had watched the entire action from the closest possible position, without, that is, coming into the danger area himself. Every vessel had its defences up against any possible attack, and each had used a different method of attack themselves. There was no possible explanation.

Complete peace reigned around the area of the space port after the withdrawal of the remaining Centauran ships, although Brady could see figures moving among the wreckage of the buildings. He waited an hour then lowered the screen to drop out another container which held a request for an immediate audience with the government. The container was thrown well outside the circle of the golden glow, which was in effect a defensive screen of far greater efficiency than any known to the Centaurans. The screen was switched up again and they settled down to another wait.

Murphy expressed his doubts that there was anyone with enough nerve left to fetch the message, after the occurrences of the past few hours.

"They'll come," promised Brady grimly. "If not we'll blast one of those buildings on the other side of the field. They'll catch on quickly enough, then."

The appearance of the second container had been seen from the control tower, but it was some time before the still dazed Commander could get anyone to collect it, and the subordinate who did so scuttled out to it and back to the shelter of the tower as if he expected instant death to strike him down at any moment.

The message was passed on to the government, and when it was received it placed the final brick in the wall of despair which had slowly been built by the Earth men since their arrival barely six hours earlier. The government of the Centauran empire realised it with stark clarity, for whatever else they might have been they were not unrealistic. The events of the last few hours had shaken them more than they were ready to admit, so much so that the President of the Council was prompted to make the first treasonous remark which had been made against the Rihnan overlords in half a million years.

He said, " Bah ! Weapons and defences supplied by the Empire, and they cannot protect us against one ship. All powerful, tcha ! Unconquerable, fiddlesticks ! The Rihnans have met their match this time, if I'm not very much mistaken. We shall be changing sides some time shortly if we grant this audience the Earthmen have demanded."

" Have you any other suggestions ?" enquired another of the Council.

" Have you ?" countered the President, and as silence greeted him, " Of course not. There is no other alternative. We must grant this audience and hope that before it is over some help will be forthcoming from some other portion of the Empire."

" I fear that will not be possible," put in another. " I have already tried to despatch messages to our neighbours, but that ship has jammed every wavelength on the subspace bands."

There was dead silence at his announcement for each of his associates had secretly been hoping that news of their plight had reached their nearer neighbours. Each of them had banked on the fact that someone had been able to send out a call for help. Now that hope had been shattered and they had no grounds on which to meet the Earthmen favourable to themselves.

The President made a motion to the waiting messenger.

" Bring the Earthmen to us," he ordered.

Sedition once begun is a very difficult flame to extinguish, and the remarks the President had made had plenty of time to take root in the minds of his associates while they awaited the coming of the earth party. When at last Brady and his followers arrived at the Council hall there was more than a hint of dignified secession from the Rihnan empire within the thoughts of the Council members.

Brady and Murphy, accompanied by six scientists, economists and psycho-politicians, made their way into the hall with a self-confidence that surprised even the downcast Council members. They had expected the Earthmen's entry to be confident, but they were not prepared for the bombastic swagger with which the party took complete control of the situation.

As Brady said to Murphy before they left the ship, " According to the psychologists the Centaurans must be suffering from an inferiority complex for the first time in their existence, and if we put on a sufficiently blatant display for their benefit we shall get all we want just for the asking."

" I'd have thought the Rihnans would have given them a complex long before this," remarked Murphy.

" For once," Brady told him, " Bannermann has ordered me to follow the advice of my experts, and not to act too much on my own

initiative. After all, he started this plan, so it's up to us to see that it goes the way he wants it."

Despite the assurances given by the psychologists that the Centaurans were too badly shaken to do any damage, Brady ordered that the landing party should wear protective suits. They were bulky and unwieldly, but would protect the wearer against any known form of atom blast. Had the Centaurans known it, the suits were a direct result of the Rihnan defence against the Neutronic Novabomb, and their quittal of the Empire would have been considerably hastened by the knowledge. But they did not know, and all knowledge as to how Earth had obtained her superior weapons was withheld from them as long as possible. That was one point which the psychologists had overlooked, and Brady did not realise it at the time. It was only later that the point became plain.

The Council had arranged themselves as importantly as they could around the large rostrum at one end of the chamber, in the hope that they might gain some material advantage if they were able to overawe their visitors sufficiently. They were, as a result totally unprepared for the confident entry of the little group of eight men, each dressed in dull grey suits projecting a peculiar golden aura, similar to that which had enveloped the ship in which they arrived. They entered quickly and determinedly, bringing with them a large piece of apparatus in its component parts which they proceeded to erect in the centre of the floor before the rostrum. They paid no attention whatever to the now bewildered Council, who had expected at the very least a slight display of deference, and who, in their wildest dreams, had never even considered that they might be completely ignored. The result was catastrophic for the Council, they felt they had lost a battle before the conference had even begun.

The President would, under other circumstances have taken action against such a display of impudence, as it was he was so astounded by the bombastic entry of the Earthmen that by the time he had partially made up his mind what to do the apparatus was in position and the group had commandeered eight seats which they placed in a semi-circle around it, facing the rostrum.

Brady wasted no time beginning the discussion. He picked up a microphone connected to the Ora-cerebral Translator, and informed the Council tersely that the equipment was for the purpose of allowing two people of different races to talk to each other with no difficulty even though they had no knowledge of each other's language. He handed the President another microphone, in order, as he put it, that the conversation should not be too one sided.

Having established contact Brady went on to read a carefully prepared statement which had been written for the occasion by the politico-psychologists, and which, while it followed the general lines of the preliminary message, was designed to draw the attention of the Centaurans to their unfavourable position in respect to the Solar system. Brady said,

" We have come here as the accredited representatives of the Solar system, to offer our friendship and co-operation," (the President felt a little better), " We realise from our observations, that you have been the unwilling tools of the all-powerful and tyrannical Rihnan Empire, and that is a fault for which we cannot blame you." (The President squirmed mentally). " We realise, too, that a race in your position has no option but to bow to the over-riding force of authority which the Rihnans have produced, and we know that the action which the Centaurans took against the Solar system was at the command of the Rihnan overlords. We feel that the total destruction of the Centauran fleet is sufficient payment for that unwarranted attack." (The President writhed physically and mentally at that painful jab). " We offer the hand of friendship to the Centaurans, and we invite them to join the free and united Empire of the Solar system as equal and co-operative members." (The President sneered cynically to himself). " If this offer is refused and you continue your unfriendly alliance with the Rihnans, then we can only promise you the same fate that will be meted out to them when the day of their final defeat is reached."

Brady sat down abruptly. A brief glance at the President showed how unhappy he and his colleagues were. Brady, himself, felt more than a trifle embarrassed at the pompous and ridiculously bombastic message he had delivered. It sounded to him like the demands of that fellow back in the dark ages of Earth's history. What was his name? Hilton ! No—Hitlan ? something like that. But the psychologists said it was just the thing for letting the Centaurans know excatly where they stood. He shrugged mentally and waited for the Centaurans to comment on his speech.

It was some time before the President spoke, and then he asked, " How do you know that the Rihnans will not destroy your entire system for what you have done to their Empire ?"

Brady answered confidently; " Because they are incapable of it."

" What makes you think they are incapable of it ?"

" Have they got a fleet of their own ?" countered Brady. " Have they got fighting ships manned by Rihnans only ? Of course they haven't. The only fighting they ever do is through the down-trodden members of their Empire. They've always left the dirty work to unenlightened stooges like you and your race."

It is certain that the word ' stooge ' had never been used to the President before, and it is equally doubtful if he would have understood it anyway, but the machine gave him a perfectly literal translation which made him writhe in his chair.

Brady went on, " The only people we have to defeat is you and the Arcturians, and the Denebolans, and the thousand and one other races that go to make up the empire. Without them the Rihnans are helpless. We shall have the whole Galaxy at our disposal, and at our disposal alone—unless some other friendly races join us in mutual co-operation."

The last phrase was added in a tone of careless afterthought, but the significance of it was not lost on the President, he bit it—hard.

Certainly no one had ever thought about the real structure of the Rihnan empire for a long time, so used were its members to the Rihnan superiority. The idea planted by Brady was something new, something which took root and grew with amazing rapidity. It aroused something that had not been known in the Empire before—it aroused resentment.

Resentment, mixed with the sedition already supplied by the President, are together powerful allies, and the President's next words told Brady and his party that they had won the first round.

The President said, " If we join the Solar empire will it protect us against possible repercussions on the part of the Rihnans ?"

Brady drew in a deep breath, " You need not fear the Rihnans if you join us, we will protect you from anything they try to do."

The President nodded, he was more than a little unhappy about the shortness of the talks. He had hoped that they would be able to reach some less compromising terms, but the way in which the Earthmen had brought the matter to a head so quickly had left him with no excuse at all for prolonging the discussions. He realised that he and the council had been rapidly and hopelessly outmanoeuvred.

" Before giving our answer we would like to ask a few more questions," he said at last.

Brady agreed.

" Why did you only send one ship against us ?"

" One ship was all that was necessary. We had to be sure that we would be allowed to land unmolested, so we used one of your own captured craft. Once landed we could begin our efforts to contact you. Had we used one of our ships it would not have got within your frontiers before warning of its coming had gone right through the Galaxy. The Rihnans would have taken fright and we would have had the whole Galaxy about our ears before we had even got started. We wanted to avoid trouble. There was no sense in launching a full scale war before it was necessary."

" And now you have contacted us you are hoping to get into communication with other systems in the same way ?"

Brady shook his head, " With you as our allies and with our fleet in possession of this part of the Galaxy we have other plans," he replied.

" And they are ?" enquired the President naively.

" That depends entirely on your answer."

" I have no doubt that such a resourceful race as yours has its plans laid against every eventuality."

Brady nodded and said grimly, " Even to the destruction of this planet if need be."

There were gasps of horror from the Council members, and the President's remaining shreds of composure vanished abruptly. He said hurriedly, " Of course we shall give the matter our deep consideration."

" That is not enough," snapped Brady. " At any moment news of what has happened may spread through the Galaxy, and if the Rihnans try to counteract our first successes you will be the first to suffer. Once you grant the main Earth fleet permission to enter your system we will guarantee your protection, but we shall not protect you unless you sign the articles which are prepared ready for your complete agreement. I must warn you also that we shall probably be forced to use this system as a battleground for our first clash with the Rihnans. And you know what that will mean."

" And if we choose to stand by our friends the Rihnans ?"

" Then you will be treated as enemies, and the first act of our fleet will be to destroy this planet so that it cannot be used by the Rihnans as a base for operations against us."

The President knew when he was beaten and glanced along the curved row of his colleagues, each of whom looked as unhappy as he felt, each of them was leaving the final decision to him. He realised with an utter loneliness that they wanted nothing to do with any such decision, but that whatever he agreed to they would accept with relief as an accomplished fact.

" Naturally we agree," he said.

" Without reservation ?"

" Ah-hum, well—er, yes," the final affirmative was an explosive afterthought as he caught a threatening move in Brady's attitude.

The signing of the articles did not take long with the aid of the Translator, and as soon as it was finished Brady said, " I will make immediate arrangements for the protection of this part of the Solar Empire, and if you will issue the necessary orders to allow the passage of our fleet through your system we will deal with everything else.

You may use a closed wave transmitter for issuing orders, and we will provide an inspector to make sure that nothing gets through to the Rihnans."

The President nodded, he could do nothing but agree. "It will be arranged," he answered. "May we know when we shall receive supplies of your weapons?"

Brady eyed him curiously. "It is not intended that the Solar Empire shall commit the same errors as the Rihnans," he retorted stiffly. "We intend to rule; we know the limitations of the races within the Galaxy, but what is more important, we also know that the Rihnans have no such limitations. We shall not give weapons to potential traitors."

"But as your allies—"

"You will have no chance to hand over any of our secrets to the Rihnans," snapped Brady.

The President made a pitiful gesture of appeal, "But we are your comrades in arms, your brothers—"

"There are certain biological and physiological differences which deny that," returned Brady ironically. "As far as we know we are the only race in the Galaxy with our own peculiarities, but of course you are aware of that."

"That is so," sighed the President. "Your weapons are mightier than theirs."

Brady grinned to himself but said nothing. Even then he did not intend to reveal to them that Terran weapons were only advanced improvements of captured Rihnan weapons. He motioned to his companions to dismantle the Translator, and the President was not able to frame any further questions, though he knew well within his mind that any questions he might think of would not alter their unhappy position one atom.

The Earthmen took their leave as suddenly as they had come.

VII.

The deployment of the Terran fleet through the Centauran system was completed within four days, Earth time, and along the main Centauran frontier with the rest of the Galaxy a guard of small cruisers and hastily erected robot detection units had been established, for it was felt within the Terran command that whatever counter-attack was launched would come from that direction.

The experience gained in the first space battle near the Moon had been invaluable to the Earth ships and crews. The battle command which had been set up at Meron, was unanimous in its opinion that the lack of conflict within the Rihnan empire over so long a period had resulted in the retrogression of any battle manoeuvres which the Rihnans might have had. Clever though they obviously were, the Rihnans would be at a decided disadvantage in any tactical encounter which might be forthcoming.

Every man aboard the Earth ships had been blooded in that first space battle, and every one of them was aflame with the one desire, to see the empire of Mankind spread throughout the stars.

The news of the secession of the Centaurans must have reached the neighbouring parts of the Galaxy, and therefore the Rihnans, within a matter of days—certainly by the time the Earth fleet was disposed through the Centauran system, but the expected counter

attacks did not come. On the main frontier everything was quiet, too quiet in fact, for not even a scout vessel was to be detected by the anxious watchers. The days drew into a week and the week drew into two, and then into three.

The Admiral in command of the joint Earth fleets held several conferences on the situation, each as inconclusive as the last. The psychologists were, for once, completely baffled. Every day the Rihnans waited the Terran position grew stronger as more and more reinforcements arrived from the Solar system. All the evidence showed that, even if they did no fighting themselves, the Rihnans had at least an elementary idea of the importance of time, and time was certainly the one thing the Terran fleets needed and which the Rihnans could ill afford to spare.

During this time, Brady questioned the Centauran President and his associates closely on the reasons why there was no sign of contact, either hostile or conciliatory form their erstwhile masters. From all of them he got the same reply, they didn't know and could make no gucsses. Since their surrender they had been almost pathetically eager to help the Earthmen as much as they could. The size and strength of the Terran fleets had plainly surprised them, for they were smaller than their own ill-fated armada, but obviously much more powerful. They were anxious to consolidate themselves as the first allies of the new regime.

So far as the Rihnans went, however, they were as puzzled as Brady, and they took no trouble to hide it. At first they had been worried about possible reprisals, but later that fear had given way to relief when they saw that the Earth fleets were going to afford them some measure of protection. Now, a month had almost gone by, and relief had given way to puzzlement and an undertone of panic. They were sure that the reason for the non-appearance of the Rihnans was that they had heard of the ineffective display of their weapons against the invaders, and were hurriedly developing some new and more violent means of destruction, weapons for use against the Earthmen and their allies, weapons against which there might be no defence.

The Admiral, whose name was Sherman, spent several long periods in his private cabin on board the flagship with Captain Brady. They were periods which grew more frustrating as they progressed, for while there could be speculation in plenty, there could be no certainty upon which they could act. Time was on their side to be sure, but as the Admiral pointed out on several occasions, time was a two-edged sword, and before long could be as great an advantage to the Rihnans as it now was to them.

At one of the conferences Brady suggested almost carelessly that they might use a small scout vessel to try and find out what was going on.

" We can use a converted Centauran cruiser with an Earth crew, but carrying a few Centaurans as camouflage," he suggested. " After all, sir, we can't lose much. At the most it'll mean a handful of men and we may pick up some useful information about what's going on."

Sherman nodded his agreement. " There might be something in it," he replied. " At any rate, as you say, it can't do any harm, and at least we'll be doing something concrete instead of just waiting for something to happen." He eyed Brady questioningly. " I think I'd like you to command the ship, Brady, what about it ?"

Brady smiled with obvious pleasure, " Is that an order, sir ?"

Sherman nodded and smiled. " I'll let you make what arrangements you think fit, but don't take any unnecessary risks. For safety's sake though don't be gone more than a week. If you're not back by then we'll know something is wrong, then we can go in and try to break it up before it goes too far."

" Shall I rig up any of our equipment on the vessel, sir ?"

" Not on your life," snapped Sherman. " The Rihnans would just love to get their hands on some of our gadgets, and I'm not giving them the ghost of a chance. If you get into any trouble you'll just have to run for it or find your own way out with what you have. I can't take any chances like that."

" Aye, aye, sir." Brady stood up. " Anything else, sir ?"

Sherman shook his head. " No, I'll have the orders ready for you in the morning. I take it you can have the ship ready by then ?"

" Quite easily, there'll be no conversion. All we need to do is get a crew aboard. May I have Murphy as my number two, sir ?"

" I hate to think what you two would do without each other," laughed Sherman. " Yes, I'll include it in the orders, Captain."

Brady's ship was a small Centauran interstellar scout. It carried a crew of fifty-seven plus a dozen uneasy Centaurans as guides and camouflage. With efficient hardness of heart Brady told each of the Centaurans that their families would be held responsible for their good behaviour on the trip, and that if the ship failed to return, whether it was their fault or not, their families would suffer. It was a cruel thing to do, but it was the only way of ensuring at least some measure of protection against a potential stab in the back.

For three days the tiny ship made its way along the fringes of the Centauran system, probing here and there into the Rihnan territory but taking care not to approach too close to any particular planetary

system. Brady, acting on his orders, tried to find the main stellar shipping routes between the various systems, in the hope that they might intercept a stray trading ship or an inter-system passenger cruiser. It was a considerable feat of navigation for the Terrans in the crew to maintain complete awareness of their position in respect of the Centauran system, for although they had the advice and guidance of the Centaurans they had to use their own judgement in choosing where they wanted to go among the almost limitless fringe of the Rihnan empire.

Brady had to work on the assumption that the Rihnans and their allies had heard at least some details of the secession of the Centauran portion of their realm, and because of that it was reasonable to assume that the Rihnans would keep that part of the Galaxy adjacent to the Centauran system clear of shipping, and as their trip progressed such appeared to be the case. He was forced to enter deeper into enemy territory than he would have wished, and to make up for that, in safety, he tried to avoid stellar concentrations that would obviously be more dangerous to their mission. If they did meet up with such a ship as they were looking for it would be better if they could do so in some comparatively unfrequented corner of the Galaxy; then if their identity was accidentally uncovered they would have a better chance of slipping back within the safety of the Terran defences before other ships were called up to deal with them.

On the fourth day Brady found himself two full days flight from the Centauran system, and much deeper into Rihnan territory than he cared about. Accordingly he turned his ship back at an oblique angle towards Ortan with the intention of straightening his course as he neared his objective. In this way he hoped to use the fifth, sixth and part of the seventh day in searching areas around and to the side of his recent path, while at the same time getting nearer to Ortan. During the third watch Brady lay in his bunk, not sleeping, his thoughts too muddled to allow his mind to rest. He was troubled at the lack of success he had had up to now, for although he had carried out his orders to the letter, and even gone a trifle beyond them in order to achieve his aim, still he knew that failure to bring some news would be frowned upon from higher quarters.

He realised, now that he had time to think about it, how barren of ideas Sherman must have been to agree to the first wildcat scheme which was put to him, for wildcat it certainly was, Brady now knew. The chances of their meeting up with other ships were remote enough, but the chance that they would meet up with a Rihnan ship and learn what was going on was still more remote, and yet things had got to such a state in the Terran command that they were willing to snatch

at such straws as the one he offered, and if it failed . . . He gazed moodily out of the cabin port at the slowly moving vistas of the heavens, where constellations which were strange and ever changing moved across his vision.

The buzz of the alarm had to struggle through his mental turmoil to make itself heard, and even as he grabbed his jerkin with automatic speed he wondered if he actually had heard its low-pitched thrum. It was repeated two seconds later and before it had finished he was out of his cabin and half way to the control room.

Murphy was on watch. He turned quickly as Brady entered, and pointed wordlessly to the white screen of the sub-space detector. A red spot flickered dead in the centre of it, a spot which would not be there unless there was another ship within detector range.

"How far?" snapped Brady.

"Five million, almost dead ahead and on the same course. It's travelling slower than we are though, so we should be up with it before long," replied Murphy.

Brady licked his lips, which were dry with anticipation.

"Have you signalled them yet?" he asked.

Murphy nodded, "Yes, I got the Centaurans to send out the standard heave-to signal. They say we shall be able to parley with them all right."

"I hope so. Make ready the boarding party as soon as we switch out of sub-space. I don't want them sending a party over to us if I can help it."

"Hadn't we better send one of our men over to keep an eye on them, sir?" asked Murphy.

"Yes, I'm going myself," replied Brady with a malicious grin, which broadened as he saw Murphy's own disappointment. "I'm going to take a portable transmitter strapped to my wrist so that I can broadcast all that goes on. I want you to arrange for a translator to pick up the broadcast and have a wire recorder running to pick up the translation. All right?"

Murphy nodded, "Don't you think it would be wiser to send someone else, sir?" he asked hopefully.

"You, for instance?"

"Well—"

Brady shook his head, "No, this is one job I'm going to do—besides, I want to have a look over that ship myself."

Murphy pursed his lips resignedly. "I'll get things moving if you'll take over here, sir."

"Carry on," replied Brady, turning his attention to the screen where the red dot was momentarily becoming larger.

The Communications officer came in a minute later and reported that the 'heave-to' signal sent by the Centaurans had been acknowledged and that the other ship was eager for an exchange of news and a few supplies if possible.

"Supplies?" echoed Brady.

"That's right, sir, apparently it's a regular thing out here in the Galaxy when two ships of different races meet, they stop and exchange things. That's what the Centaurans told me anyway, often a ship has something common aboard which is very expensive to the other and vice versa, so they do a trade and everyone is happy. I've taken the liberty of telling them to get a few things together sir," ended the Communications officer, half apologetically.

"Well, when in Rome," quoted Brady. "All right, but see they don't take too much, and make sure there is nothing of Terran origin included."

Ten minutes later the two ships flickered out of stellar drive simultaneously, and found themselves within a mile of one another drifting at parallel speed and courses. Brady ordered the boarding party to assemble at the smaller life-tender which his craft carried, and leaving Murphy in the control room with last minute orders not to do anything foolish, he joined them.

The life-tender slipped easily from its resting place in the larger ship and with its five passengers cruised slowly across the intervening space to the other ship.

VIII.

Murphy shook his head regretfully as the life-craft pulled away from the scout, he could see the tiny ship moving slowly across the scant mile of space to the alien cruiser and as he watched its progress from the control room he did not feel very happy. Quite apart from his own personal wish to lead the boarding party, he felt that it was bad policy on Brady's part to undertake the risks involved personally, such risks were usually the preogative of his second-in-command or one of the junior officers.

Murphy sighed heavily, the last thing he liked to do was sit around waiting for something to happen, his temperament demanded action in situations such as this, so too, he thought, did Brady's, which was probably why he had decided to go himself.

He left the control room and made his way down to the radio office where the translator was set up ready for the transmission that was due.

" Life-tender's alongside," he said to the operator. " Transmission should be coming through any minute."

The words were hardly out of his mouth when the loudspeaker beside the translator emitted a preliminary faint burring.

" Just been switched on," remarked the operator.

" Switch on the wire recorder," ordered Murphy, and seated himself on the plastic couch along one wall of the cabin.

He was not very optimistic of the outcome of the venture, for he realised that they had been lucky to intercept a ship at all. He listened disinterestedly to the preliminary greetings, and was only faintly aroused when he learned that the ship was a Lyran freighter carrying a miscellaneous cargo, and that it had recently left a planet in the Antares system and was bound for another in the Scorpio region.

He yawned over the technical exchanges that went on between the four Centaurans and Lyran crew, and ground his teeth in frustration as they exchanged gifts. Of Brady he heard nothing—not that he really expected to for he knew the Captain would not take the chance of even a momentary broadcast to reassure him. The minutes dragged out to half an hour while the tension within him rose to boiling point, and the mounting pile of cigarette ends in the ashtray beside him gave silent evidence of his state of mind.

The talk switched suddenly to important things as one of the Lyrans said, " We have heard there has been some trouble on the other side of the Centauran system. What is going on ?"

The voice of one of the Centaurans came metallically from the translator as he replied, " Some minor race is trying to set up its own empire so we've been told, but we have not been to Ortan for several months so have no details."

" One of these days we shall have trouble with one of the outsiders," said another Lyran. " We shall take restrictive action too late and find that the threat is much greater than we supposed."

" Nonsense," put in another, " what can one tiny system do against the might of the Empire ?"

" That's right," put in another. " Just look at this star map. All the unexplored areas are well on the outskirts of the Galaxy. Why, none of them could do enough damage to be worth worrying about without first infiltrating through the outer reaches. If any of them did try it they wouldn't get very far before the news got to Tekron, and when that happens—"

For a brief instant Murphy thought that the break was because the speaker had finished what he had intended saying, and then he realised with a shock that transmission had been broken off. He swore as he pulled himself up from the couch and crossed to the operator who was feverishly checking his instruments.

" What the hell's gone wrong ?" he snapped.

The man shook his head. " Nothing wrong this end, sir. The transmitter has closed down or broken down, there's not even a carrier wave coming through."

The intercom buzzed suddenly, and a voice hysterical in its loudness, called, " Commander Murphy, control here. That ship's gone, sir. It's disappeared."

Murphy's face went white as he leapt to the wireless cabin port. Where before had floated, serenely against the star-strewn background, the silver pencil of the alien ship, there was—nothing. His eyes swept wildly and unbelievingly among the myriad stars, searching for some trace of a departing ship, but there was nothing. He swore again and raged from the cabin, running frantically along the corridor and up the stairway to the control room.

The worried face of the third officer, Barton, met him as he lunged through the door.

" It just vanished, sir," he stammered, his voice shaky with disbelief.

" Nonsense ! What does the search screen show ?" rasped Murphy.

" Nothing, sir," reported the operator, his own face white as he turned towards Murphy. " There's no trace within any range, it just went."

Murphy's face was grim and tight-lipped and he grabbed for the search dial below the screen, swinging it to and fro, seeking blindly for a trace, any trace, that would tell him that there was a ship within detector range—but there was nothing. Space for a million miles around them was empty.

He turned back to Barton. " What happened ?" he snapped, his voice taut and breathless under the stress of his emotions.

Barton shrugged helplessly. " I don't know, sir," he answered. " One minute it was there, I could see it clearly through the starboard viewport and then, well—it wasn't there any more," he ended lamely.

Murphy swung on the screen operator. " What about you ? Did your equipment go haywire ?"

" No, sir," the man denied. " As the Lieutenant said, one minute it was there, as a red dot on the screen, and the next it was gone, just like that."

Murphy snarled his disbelief in their faces, and stepped to the main control board. He switched power to the forward drive and sent the scout cruising slowly in the direction of the spot where the alien ship had last been seen. He cruised over and through and around it, checking the instruments time and again as he did so, but there was nothing to be found. As Barton had said, the ship had just disappeared as if it had never been.

As the minutes drew on Murphy's rage and disbelief turned slowly to bewilderment as the fact sank in that with the ship had gone Brady. The search became wider in its scope as he sent the scout cruising desperately in ever larger loops in an effort to cover more territory, but at last the fact made its impression on his tormented brain that however long he searched he would find nothing.

The whole thing was fantastic and unbelievable to him, if the ship had blown up and disappeared in a raging inferno of atomic fire, or departed suddenly under its own power he would have accepted the fact as equably as he could and acted accordingly, but this . . .

It was three hours before he could bring himself to admit defeat and reluctantly ordered the ship to head back to Ortan. He left Barton in charge of the control room and went down to his cabin to collect his thoughts. He ordered written statements from the third officer and from the screen operator, and incorporated them in his own. He checked the wire recorder, but found no slight consolation in the fact that it was perfectly all right from the start up to the time it had been cut off by the disappearance of the other ship. His personal thoughts were tumults of emotion, for he had never imagined a ship wherein he was anything but assistant to Brady and he cursed wildly in the privacy of his cabin when he remembered that by rights it should have been he who had gone on that trip.

His ship came in through the guard lines precisely seven days after it had gone out through them, but he found no pleasure in the fact that at last he was in command of a ship. His orders and reactions were completely automatic as he brought her down to land on Meron spaceport, and make his way heavy-hearted to report the disaster to Admiral Sherman.

"That's all, sir," Murphy laid the typed sheets of his report on his knees and waited for Sherman to speak. He was conscious of a guilty inadequacy about the four fantastic sheets of paper which described the supernatural disappearance of the alien ship, and with the guilt he felt a flush spread over his face; he lowered his head quickly to try and hide the unwelcome evidence of confusion.

Sherman sat quiet. He had not moved or spoken, except for one explosive and incredulous exclamation at the beginning, throughout Murphy's report, and the longer his silence lasted the more uncomfortable Murphy became.

He shifted in his chair in an effort to relieve the tension, and the crackle of the plastic upholstery seemed to reverberate through the sparsely furnished office.

Sherman pursed his lips and drew a deep breath in through his nose, " I wish, Commander," he said mildly, " that you had a reputation for alcoholic indulgence."

Murphy's head jerked up at the unexpected incongruity of the Admiral's words.

" I beg your pardon, sir ?"

Sherman smiled wryly. " If you had I could pass this whole story off as a touch of D.T.'s. As it is—" he shrugged helplessly. " I find myself in the position of not knowing where to manoeuvre in an impossibly fantastic situation. That is a very bad thing for a Space Fleet Admiral."

Murphy relaxed in his chair. If Sherman was in that frame of mind then there would be no recriminations about his conduct of the affair. He felt suddenly relieved but it was a momentary sensation only, for the relief vanished as suddenly as it had come as he remembered, still with a sense of shock, that Brady was gone.

Sherman sat silent and thoughtful for several moments more before rising abruptly.

" I'm going to send a full report to the Commander-in-Chief," he announced, " and ask for scientific advice."

" Will that help, sir, even if we get it ?" asked Murphy.

" What else can you suggest ?" countered the Admiral. " We have nothing to go on except the eyewitness report of yourself and your crew. That is no use to us, for we have no scientists attached to the Fleet capable of evaluating the evidence. To a scientist your story may suggest a lot, and it is obvious that whatever has happened to Brady and that damned ship is the direct result of some Rihnan gadget or weapon about which we know nothing."

Murphy nodded as Sherman's quick evaluation sank in. " And if that is correct ?"

Sherman nodded. " Exactly. Where there is one secret there may be others even more dangerous." He smiled. " Who knows, we may even attract the brilliant and irascible Professor Hartmann."

" That'll be fun, sir," smiled Murphy. " Captain Brady told me a lot about him. He once spent a week in his Siberian laboratories."

" If he thinks it big enough he'll come," agreed Sherman. " Or at least send one of his chief assistants."

He sat down again at his desk. "That's all for now, Commander, I'll get that message off at once. In the meantime you and your crew are restricted to the immediate area of Fleet H.Q. Purely a precaution, we don't want any more mysterious disappearances."

IX.

In his spacesuit Brady was pleased to note that he was indistinguishable from the four Centaurans, and he knew that if he kept in the background while the talks went on he should have no difficulty in passing muster. The tight-fitting under-cap he wore beneath his transparent space helmet covered all the features of his head except his face, and save for minor differences in colour and bone structure there was little to show that he was anything but Centauran in origin. A member of yet another race looking at the five of them would probably notice little difference.

The tender bumped alongside the alien ship, and as he rose to follow the others through the airlock, Brady fumbled with the switch of the tiny, watch-like transmitter strapped to his wrist. It operated on an ultra-short wave band, and he did not think there was much possibility of it being picked up by anyone within the alien vessel.

They were greeted by two other beings in the airlock and Brady noted with some relief that they were a totally different type to the Centaurans. They were a dark, stocky race, one which had evolved, Brady surmised, beneath a hot sun, under the influence of stronger gravity than that of Earth. Once through the airlock and into the main hull of the ship he knew he was right, for they were greeted with stronger lighting and a considerable rise in temperature.

The ship was constructed on much the same lines as those of the Centaurans, and despite the minor differences of light and heat, Brady saw in it the hand of Rihnan development. Even the control room to which they were taken was laid out in the same manner as the one he had just left. True, it was larger, for the ship was of a bigger class than his small scout, but nevertheless he knew that there would be few secrets for him to pry into while he was aboard. He sat down in a seat which was offered him, and tried to follow the talk going on between his four companions and three members of the crew, one of whom was obviously a senior officer. From the deference with which he was treated Brady surmised he was the Captain.

He realised quickly that the conversation would have been of little interest to him, for it was carried on in snatches of diffierent languages with much gesticulation and signs to help out. It was like watching a Martian and Venusian talking together and using Earth language in the process.

The talking went on for nearly half an hour and then there came an exchange of presents amidst much good humour and hard bargaining, then they began to talk again.

Brady resigned himself to another long session with the inward prayer that Murphy was getting it all on the recorder. He wondered idly if there was anything of importance in all that was being said, and his hopes were raised considerably when they all consulted a star map and one of the aliens made a long and detailed statement to which the Centaurans listened seriously and attentively.

Through the port Brady could see the slim glinting pencil of the scout outlined against the star-scattered blackness of space. The tight knot of strain which he had carried in his stomach ever since they left Ortan was now gone and whatever else might happen at least they would have something to show for their trouble. Sherman would not be able to say they hadn't tried, and for all he knew Murphy might be recording some information of inestimable value to the Terran forces.

His eyes turned again to the port, and his stomach turned over sickeningly inside him. The scout ship was not there, the stars were not there; where a second earlier had been the blazing light of the Galaxy in all its glory was now—nothing. Nothing but pitch blackness. His brain reeled under the shock and he sat frozen in his seat, not daring to move, while his mind tried wildly to grasp what had happened.

He realised through a haze of bewilderment that conversation around him had ceased, and instead there was utter deadly silence. He turned his head slowly, and saw his four companions sitting stiffly where they had been before, one look at their faces told him that something had gone wrong and they had been discovered. The three aliens had drawn back to the door and were standing there blocking the entrance and watching them with cold wary intensity.

As he looked at them the door behind them opened and at the sound they stood aside to admit a being.

He heard a sudden startled mutter from the four Centaurans, a mutter which died as rapidly as it began, and the being stepped into the brightly lit control room. He was tall, at least seven feet Brady guessed, and he moved with a peculiar flowing grace which no Earthman of that height could have emulated. His head was the most outstanding feature of his appearance, for it was large, round and completely hairless, yet by no means freakish in appearance. Brady reflected that he *would* have looked freakish if he had been anything but tall, large headed and completely bald. The face was large-eyed and wide-mouthed, the huge domed forehead disappearing into a rounded cranium with flat oval appendages on either side which might have been ears. Physiologically, Brady decided, that was what they were.

The being eyed them all in turn, and then spoke in a high, mellow voice, in a tongue which Brady recognised instantly as Centauran, and as he spoke the words which Brady could not understand there flashed in his brain, tingling and alien in its contact. The thought, " One of you is an Earthman."

Brady's stomach twisted again, his brain felt suddenly numb under the final shock. The four Centaurans were standing stiffly where they were, obviously not willing to say or do anything, but the very direction of their looks was proof enough for the being as his large eyes roved over the five of them and finally came to rest on Brady. Brady returned the gaze with as much confidence as he could muster, his brain still spinning under the series of shattering jolts it had received in a space of less than two minutes, but it held on to one salient fact—he had

been discovered and now he must try and bluff. How and with what he didn't know, for something at the back of his mind told him that this was a Rihnan and bluff would be useless.

Even as the thought crossed his mind, he felt an alien tingle through his mind and the thought sprang within him, "Yes, I am a Rihnan, obviously the first you have met." The being said something in a strange tongue to the three crew members, and then addressed the Centaurans. All of them moved slowly out of the room and left Brady alone with his alien host.

The Rihnan crossed and sat down on another seat, adjusting it to the needs of his tall, slender form. Brady sat where he was taut and wary. Now that the climax was past his brain was ice cool again, his thoughts crystal clear, his whole being tensed ready to sieze any chance of action that might come. He thought suddenly of the transmitter still strapped to his wrist, and without a tremor or the slightest alteration in his manner, he said quietly and quickly, "Get out fast, Murphy, this is a trap. Get going now, that's an order."

A small alien chuckle sounded at the back of his mind, and he saw the Rihnan's lips twist in a manner which suggested humour.

"Your friends cannot hear you, Earthman, neither can they see this ship."

Brady let his breath out in a long sigh. He said, "That's quite a trick you pulled. Mind telling me roughly how it's done?"

In his mind sprang the reply, "Your spoken word has no meaning for me, Earthman, I can only understand what is written in your mind. As to the manner of our disappearance, as soon as I realised that this meeting was a trap on your part to gain information I sprang our own snare, but until I picked up your thought stream I did not realise that we had such a distinguished visitor on board."

Brady bowed ironically, "In other words this ship was also a trap."

"I imagine our mission was the same as yours, to try and find out what was happening within the Centauran system. We were on our return trip, when we detected your craft. I think you were on a similar mission, but we were the lucky ones. I fear your companions will return empty handed."

Brady sat quite still. Obviously the Rihnan had no idea that all the conversation between the aliens and the Centaurans had been transmitted back to Murphy and there translated.

"Perhaps not quite empty handed then," came the tingling thought-stream. "But I doubt whether they will learn much from their recordings."

Brady cursed to himself. The fact was only just beginning to sink in that among their other accomplishments the Rihnans numbered thought-reading. He wondered desperately how he would be able to combat such a terrific advantage. A sudden thought struck him.

" If you can talk to me through my mind, why did you not talk to them in the same way ?" he indicated the door through which the others had left.

" It was quite a surprise when I detected unfamiliar thought streams inside the ship," came the reply. " We had always assumed that we, the Rihnan race, were the only people who had the right type of mind for such development. We cannot talk to them because they have not the same type of mind that your race and mine possess. There is something lacking within them, something very valuable without which no race can develop as we have developed. They are as inferior to you as you are inferior to me, and yet you are more nearly my equal than ever they will be, for they are incapable of developing further without the Rihnans to help them."

" You mean you can conquer them, enslave them, treat them as you wish, but you can't do that with us, is that it ?" asked Brady.

" Shall we say, we haven't done it yet," came the half humorous response. " I agree that you are far superior to them, but you have a long way to go before you even begin to approach our standard of civilisation. I fear you will not survive to complete the long journey."

Brady ignored the threat, instead he asked, " How did you manage that trick of making the stars and my ship disappear ?"

The alien chuckle sounded again in his mind. " If you reverse that question you will be nearer the truth. To your people on that ship it would appear that we are the ones who disappeared. They would see us one minute, both on their detector screens and with their own eyes, and the next we should be gone. They might search for a long time but they would never find us."

" Quite a trick, how do you do it ?"

" Technically I doubt if you would begin to understand, Earthman, but briefly, by means of an extra powerful force-field we can take the ship and everything inside it completely out of normal space. As long as the field is on we are, to all intents and purposes, invisible, but such is the power required to maintain the field that we are forced to remain in this one spot, we have not enough power to drive the engines as well. It is a problem our scientists are working on. We shall stay where we are for a little time, and when your ship has departed we shall revert to normal space and continue back to base."

" That is one trick you never showed the Centaurans," remarked Brady.

The alien laughter echoed in his brain again as the Rihnan 'said,' " On the contrary, every ship which the Centaurans have is fitted with the device, but they don't know it is there. No ship can use it unless there is a Rihnan aboard, for it is something that is not normally needed. You should be flattered that you are important enough for it to be used on your account. I do not think it has been used before for many hundreds of years."

Brady took in the information and as he did so the obvious question rose in his mind—how did the Terran scientists miss such a thing as this when they were taking the Centauran ship apart? They had broken down everything else, why not that if it was there?

To these thoughts there was no answer, and the Rihnan rose from his seat, moving towards the door.

" If you will follow me I will show you to a cabin where you will be comfortable until we reach base," came the thought in Brady's mind.

Brady rose without reply and followed the tall figure out of the control room. He realised with heavy heart that there was nothing he could do at present; the trap he and Murphy had hoped to spring to gain information had misfired. True, Murphy might have got some information, but as the Rihnan had said, it was doubtful if it would be of any use, whereas the Rihnans had something very concrete to show for their efforts—himself. Under the circumstances he had no illusions about what he could tell them, they could suck him as dry as an orange skin and then cast him aside in the same way.

Mind reading was not one of the things he had anticipated meeting in his dealings with the Rihnans, and all things considered, his first meeting with a member of the super race had taken place in a manner which was detrimental not only to himself but to the Terran cause in general.

He followed the Rihnan along the brightly lit metal corridor, past groups of dark, staring aliens, who looked at him with something approaching awe as he followed the tall graceful figure.

They halted outside a metal door and the Rihnan pushed it open, motioning him inside, and the thought came to him, " You will be comfortable here, I will have food and drink sent in to you. I do not know how long we shall be here, but you will be able to see the stars again as soon as we revert to normal space. If there is anything you want just think of it and if it is possible I will have it sent to you."

Brady stepped inside and the door closed behind him. He was in a cabin much like the one he had had on the scout ship. It was sparsely furnished with two chairs, a large desk and a bunk, all of slightly alien design, and the grey bulkheads reminded him of the steely grey wall

of the tiny interplanetary ship which had been his first command, so many years ago that it seemed a lifetime. A wave of nostalgia swept over him, and he dropped bitterly on to the bunk, a raging turmoil of frustration and anguish enveloping his mind.

He looked at the small, square port; it was pitch black outside and no stars shone yet. Somewhere out there, he guessed Murphy was searching, endlessly and hopelessly, seeking a ship which had vanished before his eyes, suddenly and inexplicably. Soon he would give up and go home to tell of the incredible thing that had happened.

Brady's last coherent thought was to wonder what Sherman would do now, and then his overtaxed brain drifted into a troubled sleep.

X.

Brady awoke from an uneasy, dream-disturbed sleep in a muddled haze that was reminiscent of a hangover. For a minute he blinked dazedly at the grey deckhead above him, his tongue moving uncertainly in the nauseous fur that coated the whole of his tongue and mouth.

For an instant before he remembered, he wondered who was on watch, and then remembrance of his plight brought sick despair to the pit of his empty stomach. Outside the cabin port, as he turned his head, the brilliant stars glittered in dazzling array across the line of his vision, and he realised that while he slept the ship had left the shelter of invisibility and was resuming its homeward journey. With the realisation went the knowledge that Murphy must have left the scene of the disappearance and returned to report to Admiral Sherman.

Brady sighed and moved to sit up on the edge of his bunk, the movement increasing the sickness in his stomach and making him aware of a dull, pounding ache at the back of his head, a pain which lanced through his eyes with each beat of his heart. He rubbed the tips of fingers viciously across his eyes in an effort to relieve the discomfort, but the movement had no effect.

He realised that much of his sickness was caused by hunger and thirst and he wondered how long it would be before anyone came to see to his wants. His eyes wandered round the confines of the cabin; it was barely furnished in all conscience, apart from the bunk, the desk and two chairs, the only other object that could possibly be classed as furniture was a peculiar closet-like arrangement in one corner, though whether it was that or an alien washbasin or drinking fountain he could not decide, and his condition was not such that he was willing to test the possibilities of its use.

Before he could speculate further the handle of the cabin door rattled briefly and the tall figure of the Rihnan he had seen earlier came in.

Brady stood up, uncertain what to do or say, but his mind was made up for him as the thought echoed in his brain, "Your thoughts told me that you were awake Earthman, and that your appetites need to be satisfied."

Brady nodded. "Yes, I think a meal is called for."

The Rihnan gestured briefly. "As I mentioned before, your spoken word has no meaning for me, you need only think and I shall be able to understand you."

Brady swore silently under his breath, but an alien hint of humour at the back of his mind pulled him up short. He thought, "It takes a little getting used to."

"You will learn in time."

"How long before we get to where we're going?"

The Rihnan paused before replying. "About fifteen of your days. I hope you will not find the trip boring—there are few amusements or occupations on this vessel that would interest you, so I shall not suggest you try them."

Brady smiled as he thought, "Eating is all I'm interested in at the moment."

"Your food will be sent." The Rihnan turned and went out of the cabin.

After he had gone Brady realised with shocked surprise that the only sound that had been uttered during the whole of the short interview, was his first unheeding reply to the Rihnan's question about his appetites. A tingle went down his spine as the total alienness of the encounter was brought home to him.

The Rihnans estimate of the length of the trip was not far out, for Brady slept fourteen times before the motion of the stars and constellations through his cabin port began to tell him that the ship was slowing down to planetary speeds.

Until that moment he had felt only anger and frustration at his capture, but with the realisation that he was nearing the end of his journey came the fearful apprehension at the fate which he was sure would await him. He was under no delusion as to what the Rihnan ability to read minds would mean to him. He realised that he knew too much, and that his worst enemies were his own thoughts—against them he had a constant battle to keep back any information that could be of importance to his captors, for he knew that he might well be under constant surveillance by the alien mind.

The strain was not too bad, even during the long hours of wakefulness when he had nothing to occupy his mind. He made up poems and sang all the songs he could remember, then he went through every movie story he had ever seen, recalling his favourites with ever present nostalgia. Not only did these pastimes serve to blanket other more dangerous thoughts but they helped to pass the long hours of his imprisonment that would otherwise have become irksome.

Despite all this he knew that he was merely postponing the time until, one day soon, he would be forced with a battery of Rihnans each trying to force from him all the information locked in his brain. It would only be a question of time, and yet he would have to fight as long as he had anything to fight with. If there was nothing else he could give the Terran forces he could at least try and give them that, be it seconds, minutes, hours or days, for even minutes might be valuable in the battles he was sure would come.

The planet for which they were headed swung round a bluer and bigger star than Sol, and the daylight side, as they moved into it, had a dull bluish violet aura quite unlike the yellowness of Earth.

As he stepped from the ship behind his Rihnan guard Brady noted that the slight increase in gravity he had first sensed on the ship was noticeable also on the planet. It was not enough for discomfort but it was sufficient to slow him down if ever he got a chance to make a run for it. He smiled cynically as the thought passed his mind, even his innermost imaginings were open secrets to the tall, bald masters of the Galaxy, but the Rihnan gave no sign that he was aware of Brady's intention to escape if he could. The bluish light worried him a little, it had an alien quality about it that was slightly depressing, and he shivered a little under the influence of its peculiar balefulness.

From the ship he was led across the broad, metallic expanse of the space field towards a large, four-wheeled vehicle standing in front of one of the large buildings lining the perimeter of the field. There were two more Rihnans waiting for them, and all four of them got in, he and his guard at the back and the other two in front.

Brady saw none of the route along which they travelled, for the rear portion of the vehicle was completely enclosed once the doors were shut, and the light by which he could see his guard and the smooth, alien interior of the vehicle, was artificial, although search as he might he could not find its source. All through the trip he kept his thoughts alert for any slip he might possibly make, and he wondered with some amusement what effect it was having on his guards as he shuffled endlessly through a mental pack of cards.

They stopped at last, but all he saw was a large courtyard surrounded by high, bluish buildings, and then he was taken in through the doorway of one of them. The Rihnans escorted him along wide, high corridors and up uncounted floors by elevator, every step they took was past other Rihnans and brief snatches of mental greeting between them and his guards passed across Brady's mind. The experience was one to which he had not yet accustomed himself and the tingling of alien thoughts was a sensation as disturbing as it was physically uncomfortable. His body felt almost unclean, as if it were in the possession of another being with himself on the outside looking in. The fact that there was some slight basis for the reaction in actual fact, and that the other beings were quite alien in manner and appearance, completed his discomfiture.

They halted at last before a door which opened instantly from the inside to reveal a large, luxurious, but strangely furnished room. The furniture and fittings were not designed for human occupation and the bizarreness of their arrangement gave Brady a further sharp reminder that here was a race as different from his own as his was from the black aboriginals in the jungles of Venus.

There was a Rihnan inside the room and there were more short greetings before they took him across the room to another door through which he was motioned to go. As he went the tingling thought-stream of his original guard told him, "You will remain here for a while. Anything you want you may have, you have only to think of it and it will be brought to you. We shall return before long."

Then the whole group went out and the door was locked behind them.

They came back as he awoke from his first sleep in the strangely furnished room. There were three of them as before, but Brady could not tell whether they were the same three that had left him earlier or even if his original guard was among them. Looking at them he realised that it was like trying to tell one Negro or one Chinaman from another back on Earth.

He felt the now familiar prickle of alien thoughts as one of them told him, "We felt your awakening, we did not wish to disturb your rest earlier."

Brady did his best to keep his thoughts non-committal but he knew there was a tinge or irony in his responding, "Thank you."

"We have been instructed to obtain from you such information as you may possess regarding the strength, disposition and future plans of the forces which have invaded the Centauran system," the thought stream was slumbrous and seemed to invade his mind with hypnotic deadliness. Brady pulled himself together with an effort.

"You know about that?"

"We have known for some time, but like your own race we were hesitant to act until we had more information about our opponents."

Brady kept his mind as blank as he could. From here on he decided, silence, both physical and mental, was a good line to follow. There was a long pause during which he could feel the peculiar, alien prickling invading his mind, there was no coherent thought or image, only a questioning probe, dully inquisitive and nebulous in its makeup. Desperately he recited the Walrus and the Carpenter to himself, but he got stuck halfway and went on into a frantic, bawdy ballad that he had learned in Space College.

The probing ended as suddenly as it had begun, and he looked at the three Rihnans warily, his mind still carefully blanketed.

"We did not expect that you would be entirely co-operative, Captain Brady." The use of his name shocked him intolerably for he knew that he had not consciously mentioned it, and there was a mild alien chuckle of laughter in his own mind as the shock registered on his visitors.

"You see how easy it is for us to extract information? You may resist for a while, but inevitably we shall discover what we wish to know. There are three of us and I do not think that you will be able to combat the probing of us all for very long."

At the back of his mind Brady agreed with the Rihnans, but he went on doggedly with his meaningless recitations. There was a moment's peace, quite undisturbed, as the Rihnan thought-stream ended and while he was wondering vaguely about the respite he found himself thinking, "They must never know that our weapons—" he stifled the thought with hysterical horror, perspiration springing to his whitened face and brow. The faintest hint of an alien tingle, fading suddenly, warned him that the thought had been started by one of the Rihnans in the hope that he would unconsciously finish it off. His jaw set grimly and he started through the Walrus and the Carpenter again, striving to remember the verses he had forgotten.

Once more he felt the gentle insidious probing, the alien prickle of external thoughts creeping, prying, seeking the strands of knowledge which he fought so hard to withhold. He wiped the sweat from his brow with his handkerchief and gazed stolidly at the blank wall behind the Rihnans as they sat in a half circle before him. The Walrus ran out on him all too quickly, and the alphabet, recited forwards and backwards, did not help a great deal.

He felt suddenly despairing. He knew he could not keep this sort of struggle up for very long, the strain would begin to tell soon and his own mental exhaustion would be the rock on which his efforts would fail. As the despair grew he wondered if it were really worth

attempting the effort, for at the most it would mean a few hours before his mental breakdown was complete and the hours would mean little to Sherman and his fleets. Even with . . . He pulled himself up sharply, an ice-cold wash of fear clearing his brain as he realised that the despair was not his own, that the thoughts were being cultivated by outside influence. He felt a desperate relief that he had spotted the trap in time, and he smiled wryly as he thought, " Nice try fellows."

The tension relaxed and he saw the three Rihnans look at each other with their large, luminous eyes, but he could not tell from their expressions what the glances were meant to portray and no thoughts came to his mind to tell him what they were thinking.

He took the pause thankfully, letting his mind relax slightly and stretch itself. He was quite unprepared for the blinding, paralysing holocaust of thought which hit him with uncontrolled fury. It came suddenly, lance-like in its intensity, striving to beat down by sheer force his mental control, and his world dissolved in a pounding merciless flood of questions and answers, images and words, so that he did not know in the turmoil which were his own and which the Rihnans. He shut his eyes, burying his head in his hands, trying desperately to shut out the devilish cacophony which seemed to tear his soul to shreds of white hot pain.

He thought black, striving to subjugate every flicker of thought in his mind to the ultimate negativeness of colour; he flooded every corner of his brain with the consciousless blackness of space, his eyes screwed tight in their sockets under the intensity of his efforts. The probing lances hesitated and he was half conscious of a partial withdrawal as the ferocity of his own effort hit them, but the victory was short lived, for the probing came again screaming through his mind so that his throat contracted and his lips opened in a cry of soundless terror. His brain felt as if it was being torn asunder, and the black barrier he strove to maintain crumbled under the weight of the sustained assault. Something seemed to give within his mind as the self-imposed darkness reeled back, and his tortured brain let it go in the dim realisation that it could no longer hold on. He let it go and grabbed hysterically at the first primeval thoughts that came to it; an insane riot of colour, uncivilised and horrible, took possession of his mind, a gyrating kaleidoscope which hit back at the torturing probes with maddened, uncivilised violence, while his body shook and his muscles tensed under the strain of the struggle.

As suddenly as it had begun the assault ended. The alien attack collapsed, receded, and was gone, and Brady's tortured mind subsided into semi-conscious stupor, through which an odd series of thuds had to force themselves to register on his brain.

White and shaken, he sat for several long minutes, the tension slipping from him leaving him sick and weak with reaction. His head ached as it had never ached in his life before and the whole of the top of his skull felt as if it would blow off at any moment. Even so, the thuds he had heard raised vague curiosity within him, and he opened his eyes painfully in an effort to find out what had caused them.

On the floor in front of him, whence they had fallen from their seats, lay the bodies of the three Rihnans, all of them unconscious. He did not have time to puzzle on the peculiarities of the situation before the accumulated strain of the last few minutes overcame him and he slid back, himself unconscious, on the bunk.

XI.

Admiral Sherman's request for urgent scientific aid was acknowledged personally by President Bannerman. The news of the fate which had befallen Brady had upset the President in no small degree for he valued Brady's wide experience in dealing with alien races very highly.

Privately, Bannerman was annoyed at whatever motive or decision had prompted Sherman to send Brady on a mission which endangered his safety, and possibly his life, but the President realised that he was not in a position to criticise on-the-spot decisions of that nature. Sherman's efficiency had been proven in the past as so had Brady's.

Professor Hartmann, for whose services Sherman had particularly asked was not available. His research work was, at the moment, far too important for him to be spared, and he complained bitterly when the President suggested that his assistant, Ben Wilson, should go instead. Bannerman had been adamant. Hartmann, he agreed, could not be spared but Wilson could, and he issued the necessary orders in spite of Hartmann's complaints.

Wilson, together with two assistants, landed at Meron precisely two weeks after Murphy's return, and his arrival was greeted, none too enthusiastically, by Admiral Sherman who was inclined to regard him as a second-rate substitute for the real thing. The real thing being, of course, Hartmann.

Wilson's pugilistic frame loomed large in Sherman's office as he shook hands first with the Commander-in-Chief and then with Murphy.

" Sorry to hear about Brady, Admiral," he said. " Too good a man to lose."

Sherman nodded agreement and motioned Wilson to a chair. " Just how good we're beginning to and out. We're hoping you'll do something about getting him back."

Wilson pursed his lips. "Pretty tall order, judging by your reports. I've studied them during the trip from Earth, and, frankly, I don't see what I can do. There are no facts to go on except your eyewitness reports and the supposition that this ship had some equipment which caused it to vanish and which we don't know about."

"Well, we're in your hands," Sherman told him. "We haven't any competent scientific brains in the fleet who can do anything, that's why we sent for help from Hartmann."

Wilson grunted. "Every fleet in command like this should have a scientific complement."

"We're beginning to realise it."

Wilson sat quiet for a moment deep in thought, then he turned to Murphy and asked, "In your report, Commander, you stated that there was no evidence of energy release of any kind."

"That's right," replied Murphy. "None of our detectors showed a thing. One minute the ship was there, the next—well, it was as if she'd never existed. There was no sign of anything on the radar screen and nothing in the energy detectors, as there would have been if she'd blasted off. Another funny thing was the attitude of the Centaurans that we had aboard, they seemed scared stiff. They had certainly never seen anything like it before, which leads us to believe that it is something entirely new."

Wilson nodded, his brow furrowed. "No energy release infers that the ship never blasted off—in which case she never left the spot."

Murphy blinked in bewilderment. "I don't get it."

Wilson grinned and rose from his seat. "Neither do I, but I'll sleep on it." He turned to Sherman. "Say, Admiral, do you think you could get hold of a ship as near like the one that disappeared as possible?"

"It's already been done, Professor."

"That's right," nodded Murphy. "I spent the best part of ten days scouring the Centauran ship yards, and I've got one that, to all outward appearances at any rate, is the double of the one that vanished."

"Fine," Wilson smiled. "We'll start work in the morning."

"My secretary will show you to your quarters," Sherman told him.

"Thanks, Admiral, be seeing you."

As the door closed behind his bulky form Sherman turned a quizzical eye to Murphy. "Not my idea of a scientist, Commander."

"Nor mine," grinned Murphy. "But Brady thought a lot of him, and I know Hartmann values him highly, sir."

"Well, that should be good enough recommendation, though I must say he looks more like the fleet heavyweight champion than a scientist."

Wilson wasted no time the next day. He was at Sherman's office early with a request for a couple of dozen electronic technicians to help him and his two assistants. They were readily forthcoming and Wilson straight away plunged into the task of taking the ship apart.

At first both Sherman and Murphy had assumed that he would want the vessel merely to inspect it and see what type of craft it was that had disappeared, but even after the first few hours it was obvious that such was not the case. Murphy was more than a little disturbed when he was told in the mess at lunch time, that, " that boffin type is pulling the guts out of that ship piece by piece." He frowned and answered noncommitally, nevertheless the more he thought about it the more he worried. What on earth was Wilson playing at ? Surely he didn't expect to find anything in that vessel ? He was only doing what had already been done in the laboratories back on Earth years ago, he was just wasting time.

He mentioned his thoughts to Sherman during the afternoon and the Admiral agreed.

" I should have thought laboratory work was called for now, not pulling a blessed ship apart. I think we'll go down and take a look round."

They found Wilson sitting on a step in the main power room of the Centauran cruiser. His face and hands were smeared with grease and he was singing a tuneful, but highly disreputable ballad, in a deep inaccurate bass.

" Hi, Admiral ! Hi, Murphy," he greeted them. " Come to see how we're making out, huh ? Bit early yet you know."

" Not exactly, Professor," replied Sherman. " Matter of fact we were wondering why you were wasting your time here. After all," he added with a conciliatory smile, " you're not likely to find much."

" You don't think so ?" Wilson eyed the pair of them. " Why not?"

" Well, it's obvious," put in Murphy, " whatever it was that the Rihnans used for their disappearance trick is hardly likely to be anything you'll find here. I told you the Centaurans were as surprised as we were."

" You reckon the ship was Rihnan manned ?"

" Well, after all—" Murphy flapped one hand in vague despair, "—it must have been for them to realise they had an Earthman on board as soon as Brady went among them."

" Then why," asked Wilson, " didn't they realise it immediately ?"

There was no answer.

" My view," he went on, " is that there were a few Rihnans on that ship, but apart from that it was what it was supposed to be, a freighter from the Lyran group rigged up to scout just like your ship. We

know for a fact that the Rihnans have no ships of their own, but they utilise those of other races as necessary in just the same way as you did."

Sherman frowned, "So?"

"We know also," continued Wilson, unabashed, "that the vessels of one race must, except for minor details, be very much like those of another race, after all they are all Rihnan built. I think that this vessel," he tapped the floor with his foot, "is probably a near duplication of the one you encountered out there, and if that is so then it should contain the apparatus which was responsible for the disappearance."

"It could have been installed on the other ship when the Rihnans wanted to use it," pointed out Murphy.

"Could be," agreed Wilson, "but it's unlikely. After all, the Rihnans have known for thousands of years that no race can use any of their weapons unless they have been shown how. They certainly couldn't puzzle out something they don't know is there."

Sherman gestured angrily, "We know all that, but why should it be so?"

"Search me," shrugged Wilson, "but it is. Anyway, as I see it, whatever this gadget is it's probably installed in all vessels of similar type irrespective of race, all I have to do is find it. And now, if you'll excuse me—" he grinned gently at them.

"Yes, yes, of course," Sherman blushed faintly under his tan. "Let me know if you want anything."

"Sure will."

Outside the ship Sherman looked at Murphy with helpless indignation, "Now what?" he asked.

Murphy flushed in turn. "I guess he must know what he's doing, sir."

"I hope so," growled Sherman.

Two days passed slowly and without result, and all that Murphy saw of Ben Wilson was at mealtimes in the officers' mess when the scientist appeared in greasy overalls, usually whistling and always overpoweringly cheerful. The first morning at breakfast Murphy had caught his eye and asked him, with gloomy interest, "Any luck yet?" To which Wilson grinningly replied, "No, not yet."

Ever after in the mess Murphy never had to ask, for as soon as Wilson caught his eye he would wave a fork or spoon cheerfully at him and inform him, "No, not yet," with a cheerfulness which Murphy found nauseating.

Nevertheless, Murphy found it impossible to take an active dislike to the big, broad-shouldered scientist. His attitude was so much like

that of an overgrown college boy that it contrasted oddly with his scientific outlook, and Murphy found himself wondering on occasions whether he was as brilliant as his reputation made him out to be. He knew very well that the question was pointless.

He was at lunch on the third day of Wilson's inspection of the ship, when the scientist came in, whistling as usual, his overalls dirtier than ever. Murphy made up his mind that he could not stand another, "No, not yet," being thrown at him, and he went on with his meal as if the scientist's presence at the counter of the cafeteria had gone unnoticed by him.

When he had collected his food Wilson left the counter, and to Murphy's surprise and inward disgust, crossed to the table and sat down opposite him.

"Hi, Murphy," he said cheerfully.

"Hi, yourself," Murphy replied and went on with his meal, wondering vaguely why Wilson should suddenly seek his company.

Wilson made no attempt to enlighten him, but rubbed his hands boisterously over his plate as he remarked, "Good grub you fellows get here."

Murphy shrugged disinterestedly. "Could be worse, I guess."

Wilson tucked into his meal with a fine show of appetite and after a few voracious mouthfuls he waved a fork in Murphy's direction and asked in a conspiratorial whisper, "Noticed anything?"

Murphy blinked in astonishment, "No."

Wilson winked, "I haven't said, 'No, not yet.'"

Murphy stared blankly for a moment before the significance of the statement burst upon him. "You mean you've found something?"

"Uh, huh! I reckon so."

"What is it?"

"Come along to the ship after lunch and I'll show you and the Admiral. I phoned him before lunch."

"But what is it?" insisted Murphy.

"Maybe nothing," replied Wilson unconcernedly. "On the other hand—" he winked again. "Anyway, you come along and see for yourself, say about fourteen hundred." And he refused to say another word about the subject.

At one o'clock Murphy finished his meal, gave up the struggle to drag information from Wilson, and left him to finish his own lunch with a promise to be at the ship by two.

At a quarter to two he went to Sherman's office and found the Admiral already preparing to leave.

"Do you think there's anything in it, sir?" he enquired.

"There'd better be," replied Sherman grimly. "That young man is altogether too light-hearted for my money."

"He didn't give any hint?"

"None at all, just told me to be at the ship by two o'clock if I wanted to see the opening of Pandora's box. We'd better go, Murphy."

They found Wilson in the main control room of the cruiser, still whistling and still greasy. He greeted them cheerfully and led them over to a large board which, with its dials and controls, its viewers and screens, was the brain of the vessel. His two assistants were working there steadily and unhurriedly, but they moved aside as the three men approached.

"Know what that is?" asked Wilson.

A flicker of impatience crossed Sherman's face. "Of course, it's the main control board," he answered.

"No, no," said Wilson. "I mean that portion of it which I've marked out with a white chalk line."

Sherman and Murphy both looked at the area he indicated, and it was Murphy who replied, "Why, sure. It's the control point for the ship's protective screens."

"Smart boy," smiled Wilson. "Now then, look a bit closer and tell me if you see anything peculiar about it."

Sherman eyed Wilson uncertainly. He was obviously wondering if the scientist was not playing some form of practical joke on them, and in his own mind Murphy was wondering about it as well. They peered closer at the chalk enclosed area, Murphy searching intently. He had seen similar boards a hundred times before on a dozen different vessels; the keys and switches, the dials and screens were all as he would have expected them to be, and everything appeared to be in perfect order. Beside him, Sherman too was frowning as his eyes wandered across the board. After a minute or so the Admiral turned away and shook his head, "I'll buy it," he said. "What's so funny?"

"How about you, Murphy?" asked Wilson.

"It's just like any other board I've ever seen."

"Exactly. It is just like any other board or screen control you ever saw in this or any other ship, and despite the fact that you and a hundred thousand others have seen boards like this on countless occasions before, you have never noticed anything peculiar about it."

"Oh, for heaven's sake, man," snapped Sherman, "get on with it. What is wrong? You seem to know all about it."

Wilson grinned, and moving nearer to the board, pointed to a dial in the centre of it. "Just look at that dial," he told them. "Now then—?"

Murphy frowned. " It's the control that shows how much power is being fed into the screen circuits. When it reaches the red mark on the dial it means that the screens are on maximum power. The switch below it is the power control."

" Right," interrupted Wilson. " That red mark is only a third of the way round the dial. That dial is the only one on the whole board which is so marked. I presume it is the same on all other ships ?"

" Of course," replied Sherman.

" Doesn't that strike you as odd ?"

Murphy stirred uneasily, but neither he nor Sherman answered.

" What would happen, do you suppose, if the needle could be sent right around the other two thirds of that dial ?"

Murphy laughed. " That's easy, you'd blow every power source in the ship, if you can do it, but you can't, the switch doesn't have enough play in it to allow that to happen."

Wilson nodded, " Yes, I'd noticed that. But if you blow everything in the ship like you say, then why fix such a dial in the first place ?"

Sherman too was frowning hard. " Yes, indeed," he said half to himself. " Why not fix a standard dial ?"

" Odd, isn't it ?" remarked Wilson chattily, and as he spoke he put out one hand and began to turn the switch slowly round. " As a matter of fact," he went on, " we wondered about it too, so we have removed the stop which prevents the switch being turned too far, and now we shall see what will happen when it is turned right the way round." He did not stop as the needle reached the red mark on the dial, but continued to switch every possible ounce of power into the screen projectors. " Of course," he said mildly, " this could blow the entire ship to kingdom come."

Sherman and Murphy watched him grimly, neither of them daring to speak. The whine of the generators rose in pitch as the needle swung slowly round the dial until, finally, it came to rest against the extreme edge of it. As it did so Wilson dropped his hand from the switch and eyed the dial reflectively. Then he turned and looked out of the forward view port.

" Seems to have got a bit dark outside," he informed them.

Sherman swore and moved to another port with Murphy at his shoulder. As Wilson had said, it was as black as pitch outside the ship, and even the lights from the control room cast no shadows or beams through the stygian depths.

" At a guess," remarked Wilson, " I would say that the ship is now totally invisible from outside."

"I'll be damned," growled Sherman. "So that's how it's done. And under cover of this they could sneak off and we'd never know a thing about it."

"No, I don't think they would," replied Wilson. "As you said just now, to keep this up requires about ninety-five percent of the ship's available power, and with it on they couldn't move an inch. My guess is that they just stayed where they were for a few hours until you had cleared off and then re-emerged from their cloak and buzzed off home."

Murphy turned on him, "You mean—if I'd stayed—?"

Wilson nodded soberly, "They would have probably emerged under your very nose."

Murphy swore luridly. Wilson turned away and began to put the switch back to its normal position.

"Hold on," snapped Sherman. "Suppose someone has wandered into the area in which we materialise."

"No fear of that," Wilson assured him. "I had an area marked off around the ship and warned everyone to keep outside no matter what."

He turned the switch faster, and light flooded suddenly outside the port as the ship flickered back into visibility. From the ports Murphy and Sherman watched with growing amusement the bewildered antics of the crowds of Earthmen and Centaurans outside.

"They seem upset," remarked Wilson coming up behind them.

"Yes, I think we'll talk this over in my office," replied Sherman.

Sherman's office was a haven of peace after the questioning uproar through which they had to push to reach it, and Murphy for one was glad to shut the door on the hubbub outside as everyone within talking range demanded to know what had happened.

"Now," said Sherman, as they settled themselves, "you must have some other ideas about all this, Wilson?"

"Quite a few," admitted the scientist. "Although at the moment I could kick every big brain on Earth from here to hell and back for not having spotted it before. Once they'd broken the secret of the protective screens they didn't bother to look any further. Can't blame them I suppose, I wouldn't have bothered myself except for the fact that I was looking for just anything out of the ordinary. As I see it, there is a dual effect as a result of the screen circuits. On low power they are merely protective screens, but on maximum power the circuits perform some feat of warping space or taking whatever is inside the field right out of normal space altogether."

"I still don't see why it wasn't discovered before," declared Sherman.

"Too easy, that's why. Scientific curiosity was satisfied when they'd found what happened when the needle reached the red mark."

Sherman sat quiet, his hands playing idly with a paper knife on the desk in front of him. At last he drew a deep breath and said, "So now we know what it is and how it's done, but what good does it do us?"

"Quite a lot, I'd say," returned Wilson. "At the moment a ship using that field is anchored to the spot through lack of power, but supposing it was able to move about?"

"By God— !" Sherman's eyes gleamed. "That would be something."

"How would it see where it was going?" put in Murphy dubiously.

"One thing at a time," grinned Wilson. "Anyway, I'll work on it." He stood up and stretched his big frame. "And now, back to the task of explaining to all those guys out there that what they saw was actually an optical illusion."

"Anything you want, Professor," began Sherman.

"I'll ask for it," replied Wilson blandly.

He vanished through the door and Sherman turned to Murphy who was sitting thoughtfully beside his desk. "Well, that's that, Commander We nearly made ourselves out to be bigger fools than we really are."

Murphy grinned abstractedly. "Sir, now that it's been taken care of I've been wondering about Captain Brady."

"What about him?" The twinkle faded from the Admiral's eyes as he asked the question.

Murphy shifted uneasily. "He could be pretty important to us either way, here or in the Rihnan's hands. I'm wondering if he might not be important enough for us to try and get him out."

"No personal feelings?"

"A few naturally," admitted Murphy. "But it wouldn't do us any good if they managed to learn too much from him."

"Agreed, but I don't feel justified in risking ships and men on a mission that has a good chance of failing. Besides, we don't know where he is."

"We have a good clue, sir," Murphy told him. "Just before the vessel vanished one of the crew said they were bound for Tekron; it could have been a false steer, but on the other hand if they had no suspicions of us at the time it could be true."

Sherman nodded. "But I'd have to let you have a fully armed ship to give you any chance of coming out alive if you do find Brady. If that ship gets captured—"

"If they have already got the information from Brady it won't matter. If not, we can fix the vessel's destruction if it is threatened with capture."

"You've been doing some research, Commander," said Sherman accusingly. "What else have you decided?"

Murphy flushed. "Well, sir, some Centaurans who have been to Tekron have given me a plan of the city showing the spaceport and a large building about a quarter of a mile from it which is the Rihnan Headquarters. If Brady is on the planet he'll be there, that is my guess. We can use a camouflaged merchant cruiser, go in slow so as not to arouse suspicion, and once we've landed—"

"Take the Rihnan H.Q. by storm and get Brady out." Sherman nodded and sat back in his chair. It was a hard decision to make, for as much as he valued Brady's services he was well aware of the issues that would be at stake in the event of failure. Brady had been a prisoner for a long time, long enough for him to be sucked dry of all the important information he carried in his mind. God only knew what devilish practices might have been used on him. On the other hand he might have bluffed his way through.

Sherman gazed up, unseeingly, at the ceiling. If Brady had been forced to divulge information then the loss of the ship would be only an added nuisance, but if he had bluffed his way through—it was worth taking the chance, and Brady himself might have picked up some information on his own account.

He turned on Murphy with quick decision. "Let me have your complete plans for vetting by nine tomorrow morning, Commander."

To be continued.

Time-travel has been irresistably attractive to science fiction writers ever since Wells' *The Time Machine* pioneered this theme over half a century ago. The chilling paradoxes inherent in the conception of travelling into the past have once again failed to prove an obstacle and in Jonathan Burke's **Pursuit Through Time** (Ward Lock—10/6d) the characters hop back and forth in the temporal dimension with the ease of flying fish over the International Date Line. Nevertheless, once such glib plot mechanics have been accepted—and in a novel such as this they are not all that important—I can report that, in the new and somewhat superior company in which Mr. Burke now finds himself, he has produced what is, in my opinion, his most readable book to date. The plot is pure corn, but the characters are almost life-like, their dialogue is smoother and convincing, and it is a pleasure to see the almost outmoded technique of alternating chapter-climaxing action being used successfully to move the story apace. Recommended for unpretentious escape entertainment.

The annual " Best Science Fiction Stories " volumes, selected by top American anthologists, Bleiler & Dikty, are now recognised as the standard of excellence in the science-fiction magazine field. The distillation of 1953's better short stories (ten out of the thirteen originally published in the American *Best Stf. Stories*: 1954) now available in **The Best Science Fiction Stories—Fifth Series** (Grayson & Grayson —10/6d) is one I cannot quarrel with, especially as in such a vintage year the problem of restrictive selection must have been difficult. Among the memorable stories honoured by inclusion, four are outstanding—impeccably styled and finely written. Ward Moore's "Lot" is a new and realistic atom-era variation from biblical derivation, Jack Vance's " DP !" an emotionally powerful condemnation of man's inhumanity to troglodyte, and Walter Miller's " The Sower Does Not Reap " a thoughtful and intriguing aspect of Mars colonisation. And finally " What Thin Partitions " by Mark Clifton and Alex Apostolides mixes psi and invention with hilarious results. In descending order

there follows "The Collectors" (very disturbing), "Yankee Exodus" (Mark Twain humour), "The Model of a Judge" (for its perfect ending), "Wonder Child," Richard Matheson's "The Last Day" (for its contrasting moods), and Fritz Leiber's "The Big Holiday" (which is the *nicest* story of the lot).

Arthur Sellings is a name unknown to most fantasy readers in this country, yet I venture to predict that he will rapidly and deservedly achieve distinction as a skilled craftsman in the short story medium. In the past year or so he has had frequent acceptances by leading American magazines, and his introduction here is both timely and welcome, with a collection of sixteen new stories called **Time Transfer** (Michael Joseph—12/6d). On the strength of these I have no hesitation in placing Mr. Sellings among the top three English writers in this story length. His multi-faceted imagination blends with an assured and faultless writing technique to lend freshness to some well-used plots, and to impact vividly with some striking original ideas. He is more interested in the reactions of his fellow humans (acutely discerned) to somewhat improbably situations rather than detailed gadgetry, but is not above invading the thought processes of one or two chillingly probable aliens. Then there are some highly diverting combinations of both, whilst robots and even a figment are used to agreeable effect. But it is in such stories as "From Up There," "The Proxies," "The Age of Kindness," and the title story, that he scores with an appeal to human emotions that neatly miss the level of cloying sentiment that would result from a lesser pen. Strongly recommended.

The third novel by Scots author J. T. McIntosh, **One In Three Hundred** (Museum Press—10/6d) is also the best he has written, and for a forceful description of man's unwilling exodus from a doomed Earth to the planet Mars, is unequalled in my reading experience. Originally published as three novelettes in the American *Magazine of Fantasy and Science Fiction* (which eclat is itself a token of the book's excellence) under the titles "One in Three Hundred," "One in a Thousand," and "One Too Many," the American hard-cover edition achieved third place in the 1955 International Fantasy Award. The story deals realistically with a situation in which only a small percentage of doomed mankind can take its chance for life in the limited accommodation of a hastily-built space-fleet. Choice is left to selected lieutenants—an awful responsibility—and Part 1 shows how Lt. Bill Easson picks his party of ten from the three thousand odd men, women and children in the small community of Simsville, U.S.A. Human emotions are bared vividly, and the author pulls no punches in the

resolving of the " fantastic new numerology " which faces a world in which complete panic is avoided by virtue of this grim game of chance. Part II follows up with the hazardous flight of this one particular unit to a safe landing on Mars, and the trilogy is neatly rounded off with the stormy settling down of the survivors to the difficult conditions of the new planet. The gripping realism of the characterisation does much to give lusty life to this thought-provoking adult science fiction novel.

The lone juvenile of the month is **World Of Mists** by Patrick Moore (Frederick Muller—7/6d) and is evidently the second of a series which promises to rival William Temple's " Martin Magnus " yarns (from the same publisher) in appeal to the science-fictionally minded youngsters of today. Somehow I missed the first book—*Quest of the Spaceways*—but here Gregory Quest, another rugged interplanetary hero, is somewhat overshadowed by the omniscient scientist, Professor Fell. Between them they prevent a calamitous explosion on the planet Venus where the pure oxygen poured out by an atmosphere-modifying installation is likely to react with an unstable element in the planet's crust when a certain ratio is reached. Simple but pleasing fare for the unsophisticated.

Finally two non-fiction items, each qualifying for commendation in their different categories. Frank Ross, Jr.'s **Space Ships and Space Travel** (Museum Press—12/6d)—excellent value !—covers a lot of familiar ground, but is a readable study of the pattern so far in interplanetary projects and as such, couched in non-technical language and usefully and copiously illustrated, achieves its purpose of popularising the subject with greater effect than many of the more tedious scientific treatises.

I have actually reviewed the other book previously in this column (*New Worlds*, July 1954, No. 25) when it appeared originally in France under the title " Les Soucoupes Volantes Viennent d'un Autre Monde." Faithfully translated, but less ten of the original twenty extraordinary illustrations, it is now made available for the English enquirers into the truth of the now somewhat quiescent UFO stir as **Flying Saucers From Another World** by Jimmy Guieu (Hutchinson—12/6d) and it remains, indeed, a fascinating book. However this must surely be the last volume on the subject ?

Leslie Flood.

NOW ON SALE

NOVA S-F NOVELS

The first four

NOVA NOVELS

★ THEODORE STURGEON

The Dreaming Jewels

★ JAMES BLISH

Jack of Eagles

★ A. E. VAN VOGT

The Weapon Shops of Isher

★ WILSON TUCKER

City In The Sea

ORDER FROM YOUR NEWSAGENT
OR DIRECT FROM THE PUBLISHERS

2/-

NOVA PUBLICATIONS

DERWENT HOUSE, 2, ARUNDEL STREET, LONDON, W.C.2.

Another famous Nova Magazine

Science Fantasy

128 PAGES

2/-

Bi-Monthly

presents in the current issue (No. 18)
a long complete novelette by Britain's
popular new star writer John Brunner

This Rough Magic

a "different" type of fantasy story built round the age-old cult of Black Magic but centred in the heart of modern London. It portrays the fumbling attempts of an inquisitive white man to counteract some of the "spells" which are apparently laid on him — with peculiar results.

Also new stories by :

★ *Jack Williamson*

★ *Dan Morgan*

★ *John Kippax*

★ *Lan Wright*

and others

ORDER FROM YOUR NEWSAGENT

NOVA PUBLICATIONS

DERWENT HOUSE, 2 ARUNDEL ST., LONDON, W.C.2.